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Educational News and Editorial Comment

REPORT OF THE ILLINOIS EDUCATIONAL COMMISSION

The educational commission created by an act of the Illinois General Assembly two years ago has recently published its report. Considerable attention is given to the problem of district organization. The chief difficulty in arriving at what the commission considers a satisfactory solution of the problem is the unequal distribution of the tax burden between the rural and urban elements of the population where the two are brought together in the same unit of support. Data gathered from a survey of 221 typical community and township high school districts show that, on an average, the rural portions of these districts contribute 68.2 per cent of the assessed valuation and only 37.8 per cent of the enrolment. It is shown further that, while the rural areas of these high-school districts contribute 68.2 per cent of the assessed valuation, these same areas contain only 49.5 per cent of the total school population (six to twenty-one years of age). Since the rural areas of the state have a greater assessed valuation in proportion to the number of children to be educated than have the urban areas, the commission is of the opinion that no satisfactory district reorganization can be made

under the present system of taxation. It has secured the co-operation, therefore, of a number of civic and commercial organizations in drafting and supporting a proposed amendment to the constitution which would give the legislature greater freedom in adopting methods of raising revenue. As soon as the matter of taxation can be adjusted satisfactorily, it is recommended that district reorganization be worked out on the basis of the community unit so far as practical conditions will permit. The following paragraphs summarize the findings of the commission on the subject of district organization:

> It seems clear from what has been said that the present district organization in Illinois is unsatisfactory. It seems equally clear that no district readjustment will eliminate the unbalanced distribution of school costs as between the rural and urban areas, considering the school population of the two areas. In view of this fact, the commission feels that no satisfactory district reorganization can be made under the present system of taxation. It realizes, however, that taxation is a matter which affects all the interests in the state and that readjustment cannot be made in terms of education alone. It has secured, therefore, the co-operation of a large group of representative civic and commercial organizations in Illinois in the consideration of measures looking toward a better revenue system. The chief difficulty seems to be that Article IX of the present Constitution restricts the General Assembly as to the methods it may adopt in raising revenue. A committee representing these various organizations has drafted a constitutional amendment which will be submitted to the Fifty-fourth General Assembly. The commission respectfully recommends that this proposed amendment be given the most careful consideration, for it feels that education and all the other interests of the state would be greatly benefited by the adoption of this amendment.
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> When the matter of taxation has been adjusted so that rural and urban groups can be brought together in the same school district on a basis satisfactory to both groups, the problem of district reorganization should be attacked. The particular type of district organization which should be adopted will have to be determined in the light of conditions existing at that time. It should be kept in mind, however, that schools are in their very nature a matter of community interest and support and that any kind of organization which ignores this fundamental character of the school district is likely to prove unsatisfactory. This principle should serve as a starting-point in any attempt to work out a larger administrative unit and should be departed from only as practical considerations may necessitate.

The commission recommends the establishment of a state board of education. The following paragraphs indicate the kind of board the commission has in mind:

The commission recommends that a state board of education be established in Illinois. Experience indicates that such a board should be composed of laymen interested in the educational welfare of the state and animated by a high spirit of public service. A board thus constituted should have general control and supervision of the elementary and secondary schools of the state and of the teacher-training institutions. It should have authority to determine and carry into execution general policies affecting the educational interests of the state as a whole. As soon as they can be assimilated, the state board should take over the duties of certain other educational agencies, such as the Board of Vocational Education, the Board of Trustees of the Illinois State Teachers' Pension and Retirement Fund, and the Teachers' Examining Board. The state superintendent of public instruction should be the executive secretary of the state board of education. His duties, though prescribed by the board, would remain substantially the same as they are at the present time. His chief function would be to advise the board and to execute its policies in the general management of the public schools of the state. As soon as possible after the establishment of a state board of education, the Constitution should be amended in such a way as to permit the state board to appoint the state superintendent of public instruction. The reasons for this particular recommendation are that the duties of the state superintendent of public instruction are naturally those of an educational specialist and that it is commonly recognized that appointment rather than popular election is the better method of selecting specialists.

As pointed out in another connection, one of the chief services a state board of education could render would be to direct research relating to the educational needs of the state and the means of improving public education. The state board should have authority, therefore, to appoint a director of educational research and to employ such professional and clerical assistants as may be necessary.

The report points out certain definite objections to the present system of normal-school administration and recommends that all the normal schools be placed under the control and supervision of the state board of education. The problem as to whether the teacher-training institutions should maintain their status as teachers' colleges is considered, but the commission feels that the policy the state should pursue in the training of its teachers should be determined in the light of experience and after investigation carried on through a period of years. The state board of education is regarded as the proper agency for the study of this problem. In the meantime, the commission recommends no change of policy.

A chapter in the report points out the advantages to be derived from a uniform system of school accounting and budgetary procedure and includes the recommendation that all public-school officers and

teachers be required to furnish information in such form as the state board of education may prescribe.

The concluding chapter of the report deals with the education of handicapped children. In the opinion of the commission, the state and locality should share this burden. It is recommended that the Department of Public Welfare be authorized to equip the Bureau of Juvenile Research for examining the children of any district which may request such examination. It is further recommended that any district which gives adequate instruction to mentally or physically handicapped children be awarded by the state one hundred dollars annually for each child so instructed.

INTELLIGENCE TESTS AND ADMISSION TO THE FIRST GRADE

The laws which prescribe that children must reach a certain age before they may enter school are universally recognized as arbitrary and not altogether adequate for regulating admission. What is really aimed at in these laws is a degree of maturity which will make it possible for pupils to succeed in the work of the first grade. Whatever the age required by law, some entering pupils will be too immature to profit at once by instruction. These will become retarded pupils at the end of the first period of promotion and will swell the numbers of those who must spend two years in the first grade. On the other hand, there are children who are kept out of school by legal-age prescriptions who are entirely able to take up with advantage the work of the primary class much earlier than the law permits.

Various steps have been taken in school systems to correct the arbitrary character of the present methods of admission to school. One of the most radical is described in the following newspaper item from Plymouth, Massachusetts:

> Horace F. Turner, superintendent of the Plymouth schools, is preparing for publication a report that is expected to arouse much interest. It deals with the results of experiments and studies conducted here during the last six months on admitting under-age children to the public schools by means of psychological tests. The success of the experiment has been so marked that Plymouth teachers concerned in it venture the prediction that psychological tests will eventually be substituted in New York and other large cities for the present system of excluding children from the public schools until they attain a certain specified age.

"How intelligent is your child?" and not "How old is your child?" may be the question asked by school heads in a not far distant future when parents bring their offspring to school for the first time. Merely because a child happens to be a few days or a few months younger than the rigid age limit set for entering school the youngster should not be barred, the superintendent of schools in Massachusetts' oldest town believes he has satisfactorily demonstrated.

The astounding fact of the Plymouth experiment is that of the children under the regular legal school age of five years and eight months who were admitted to the schools last September on passing the required mental tests nearly 85 per cent are now graded in the upper half of their classes, and 25 per cent are among the most brilliant pupils in their grades. In other words, the under-age children admitted on individual psychological examination are surpassing their older schoolmates who began their education at the age period between five years and eight months and six years and seven months.

Superintendent Turner and the teachers here who have been making the special study are now considering whether the minimum age limit should be abolished and children everywhere admitted to the public schools just as soon as they are able to pass certain psychological tests that will indicate sufficient intellectual development to do the first-grade work.

There was considerable opposition here when the experiment was proposed last year by Superintendent Turner. But the success it has shown has brought some of the original opponents to become firm supporters of the plan. The state superintendent of schools is much interested, and the Plymouth idea seems certain to spread.

KINDERGARTEN-PRIMARY ORGANIZATION

The problem of dealing with pupils of varying degrees of maturity at the beginning of their school careers is solved in some progressive school systems by combining the kindergarten and primary grades in a single supervisory unit. This makes it possible to adopt kindergarten methods in the case of immature pupils who have been admitted to the first grade and to give kindergarten pupils who are mature for their years some of the work which formerly was limited rigidly to the first grade.

Extracts from two reports which appeared during the past month may be cited as indications of the spread of the plan of combined organization. The *Bulletin of the San Francisco Grade Teachers' Association* contains the following paragraphs:

In an attempt to meet conditions we have a new course of study for kindergarten, first, second, and third grades in San Francisco. We have included these grades in the kindergarten-primary unit because they cover the period of child-

hood from four to eight which makes certain outstanding demands for growth. In this period children must be physically active—their main business is to grow—the large muscles demand exercise. As a result, schoolrooms are transformed into children's workshops. Every kindergarten and primary room in the new buildings in San Francisco has an alcove equipped with undivided cupboards for the children, work benches, running water, and large materials for children "to think with." Movable partitions, low blackboards, and cork pinning boards further transform our primary schoolrooms into a "home-extension department."

Children learn to move about carefully instead of to sit still. They learn to talk well rather than to keep still. They are encouraged to create, to experience with others, to originate when possible, and to profit by the criticism of the group and the teacher. They are entitled to freedom from strain—emotional stability. . . . .

Psychology has revolutionized the teaching of reading in recent years. The reading table with its wealth of stimulating material has become a part of every primary grade. Reading develops as thought-getting. Progress is from the large unit to the small. Phonics is not neglected but is left until the child is ready to analyze words into smaller parts and even then is not forced upon children who have a keen phonetic sense and do not need special phonetic help. Children learn "to read" rather than "how to read." Number sense is stimulated. Every primary room has its art gallery where children's spontaneous expressions of activities are placed.

Hammering, sawing, painting, and fashioning all have their place in the child's school life. All of these activities help to form the kind of an individual that society wants.

The *Detroit Educational Bulletin* contains the following:

The kindergarten aims to know the *child* in the *child's* world and to use the imitative, constructive, and playful instincts of the child in teaching social lessons through participation. Miss Heller, supervisor of the kindergarten and primary grades in Detroit, lists among the kindergarten goals the following: (1) adjustment to group living, (2) desire to make one's own contribution, (3) satisfaction and joy in natural activities, (4) increased facility in oral expression, (5) acquaintance with common things, (6) care of, and respect for, the body.

That the first-grade children are not very different from the kindergarten children in mental ability is indicated in Terman's *The Intelligence of School Children*. His investigation showed that the mental ages of nearly one-fourth of 112 selected kindergarten children equaled or exceeded the median mental age of 150 unselected first-grade children with whom they were compared and that more than half of them equaled or exceeded the lowest fourth of the first grade. This indicates that a large proportion of these kindergarten children have a mental ability that would enable them to do satisfactory first-grade work. It is evident that many of the playful and constructive activities which

have demonstrated their educational value in the kindergarten should have a large place in elementary education. It seems probable that word-recognition activities directly fundamental as a foundation for I B reading may profitably form a part of advanced kindergarten training.

Instead of a sharp line between the goals, methods, and materials of the kindergarten and the early primary grades, scientific investigation suggests a diagonal line. Thus, kindergarten methods are being extended upward and are modifying the teaching of the academic subjects. The recognition of labels on the objects in the room and the recognition and response to such word cards as "go," "step," "run," "walk," "hop," "fly," etc., are not uncommon in the kindergarten. Games with word cards are often enjoyed.

A COMMUNICATION

In the March issue of the *Elementary School Journal* a review was published of a first book in silent reading (Clarence R. Stone and Helen DeWerthern, *Stone's Silent Reading*, Book One). The review raises fundamental issues concerning appropriate aims, methods, and materials for a beginning text in silent reading. The National Committee on Reading in its recently published report recommends that about equal amounts of program time be spent on oral and silent reading in the first grade and definitely recommends the use of the silent-reading textbook as one of several different types of reading texts. There are now available at least four distinct types of first-grade textbooks for silent reading, each differing radically from the others in the underlying plan of the book with reference to specific objectives, method, and content. One, which is sponsored by a psychologist who has made extensive laboratory studies in reading, places the emphasis on rapid reading for enjoyment or general information and uses the true to-fact type of story. The underlying plan involves the use of accessory practice material for developing habits involved in "careful silent reading." A second, which is sponsored by the author of the chapter on materials in the *Report of the National Committee on Reading* and by the writer of the review mentioned, places the emphasis on the study or work type of reading and provides an informational content. A third provides repetitive stories for speed development and exercises and informational lessons for comprehension training. Two other first books in silent reading center upon training in comprehension because it is the main inadequacy of the oral-reading method in the

first grade. They provide a content of exercises, each of which is organized so as to be adapted to a particular type of response or comprehension check. Let us consider the issues involved in the critical review of one of these two books.

1. The review says, "From the wealth of material, the best checks, games, and practice materials might better have been selected for publication in more flexible form and not as book or reader content." After a number of years of practical experience and experimentation with the various teaching, supervisory, and administrative problems involved, the authors concluded that sufficient amounts of reading material for comprehension testing and training could not be provided economically without having material of this type in each book of a series of silent readers. Extended preliminary use of the material for the first and second books convinced the authors that, while similar types of training exercises may be used to advantage in other forms, the main and full value will only be realized by having these longer and more involved exercises in book form. Practical classroom trial rather than theories of experimental experts will no doubt decide the issue.

2. The review also says, "Action responses do provide checks on recognition and comprehension, but the materials of a sound beginning in silent reading should be far richer and more intimately related to socially significant group activities, more conducive to inquiry and abiding reading interests on the part of pupils." This criticism is easily answered by pointing out that the book has been offered as a specialized training book and that it is presumed that the values mentioned and other content and experiential values will be realized in other reading activities, both oral and silent. The Preface specifically states that it is to be one of several reading books used in the classroom. Different types of silent-reading books as well as oral-reading books are supplementary to one another. The reviewer failed to take into account this fundamental principle.

The reviewer failed to give due credit to the fact that a variety of types of response besides the action response are used in the book or to the fact that material is provided in relation to such socially significant subjects as safety, health, and manners.

3. The reviewer criticized the use of the term "project method"

in the Preface on the grounds that the method is formal and that the child does not initiate. Effective testing and training methods are necessarily more or less formal. In view of the lack of agreement among educational writers as to the meaning of the term "project method," it should probably not have been used. The expression was used to indicate a point of view, meaning, in the words of Professor Kilpatrick, of Columbia University, "the use of the purposeful act in the educative process." Genuine purpose, whether wholeheartedly accepted by the child or initiated by him, is the one point on which all authorities are agreed as being essential to the project method. In this connection the Preface says, "The child has a definite purpose each time he reads." This point was not challenged by the reviewer. Other statements that were not challenged are: "The reading is based upon activities that make a strong appeal to the pupils." "Throughout the book, the child is confronted with a problematic situation that forces him to think as he attempts to read." Many teachers and supervisors have mentioned these points in favorable comments. The reviewer either should have challenged the correctness of these statements or should have given favorable comment upon them. It is a strange review that finds no favorable word for a book that has been selected for class use by thousands of progressive teachers and supervisors within a year.

CLARENCE R. STONE

SHALL TEACHERS BE RATED?

There are two opposing tendencies in the educational world. On the one hand there are agencies which are striving to improve teachers in service by giving them standards which they can use in judging themselves. On the other hand there are organized groups in the educational systems of the country which are prepared to do all that they can to discredit rating systems.

The opposition between these two tendencies comes very emphatically to attention in two recent publications. The Bureau of Education has issued as City School Leaflet No. 18 for 1925 a series of *Samples of Teacher Self-rating Cards*. This is a very useful collection of the rating systems employed in various cities.

It will be used by intelligent superintendents and will be accepted as a very helpful guide by progressive teachers who are anxious to improve themselves.

Almost as soon as this valuable publication appeared, the American Federation of Teachers, seeing danger for its creed in the spread of such material, published the following characteristic pronouncement in its monthly bulletin:

TO BE OR NOT TO BE—RATED

Samples of Teacher Self-rating Cards is the subject of a pamphlet published by the Bureau of Education in February. It is No. 18 of the City School Leaflets. Send five cents (not stamps) to the Superintendent of Documents, Washington, D.C., for a copy. It is not surprising that only 3 per cent of the superintendents reported that they experienced no trouble in administering a salary schedule based on merit. Merit connotes strange things in some minds. While Berea, Ohio, has a fair and helpful self-efficiency test, other cities like Minneapolis employ a modified Bertillon system, forgetting that Bertillon perfected a scheme for identifying persons, not for determining their degree of guilt. Virginia, Minnesota, in the Mesaba iron range, sends out a questionnaire of 205 questions, which might be adequately answered in a week without interruption. Antigo, Wisconsin, best known to auto tourists, has an efficiency record sheet larger than the town itself.

Fortunately, the author of the report finds "that some school officials are beginning to appreciate the fact that the teacher is a factor to be considered," and well concludes, "The valuable point, of course, for teachers in their self-rating is to help them to know themselves, to find their own weaknesses, and to correct them."

The interesting point which the writer of this attack on rating systems fails to note and perhaps does not know is that rating and merit systems are steadily spreading. The idea that teachers can be held at a common level by labor-union devices is a dream of incompetency. The fact is that communities demand of their professional servants increasing efficiency which can be demonstrated and measured. The most competent teachers are eager to render the highest service and to avail themselves of every possible device which will help them to improve and to profit by improvement. Rating is not to be scoffed out of existence in an age when merit counts in every profession.

FAILURES IN ELEMENTARY SUBJECTS

The following newspaper item is issued from Trenton, New Jersey:

> Commissioner of Education John Enright today submitted to the State Board of Education a report showing that of more than 10,000 pupils examined for admission to high school approximately 30 per cent failed to attain a passing average. Less than 20 per cent received as high as 90. The greatest number of failures was in arithmetic, with English, history, geography, and spelling next in order.

There are a number of phases of this item which are important. The failure of one-third of the pupils can hardly be attributed to lack of native ability. The fact that failures are most common in arithmetic ought to stimulate students of education to a more vigorous attack on this subject. It is one of the most difficult subjects to organize properly, and most of the scientific work which has been done in connection with arithmetic has been in the form of tests, which have revealed pupils' deficiencies but have contributed very little to a better understanding of the reasons for these deficiencies.

Finally, it is suggested by the comparatively successful record in spelling that the preparation of graded spelling lists based on usage and organized after trials in the schools has had a salutary effect on the teaching of spelling.

AN EXPRESSION OF HUMAN GOOD-WILL

Superintendent F. G. Blair, of the State Department of Public Instruction of Illinois, has discovered and published in the official bulletin of the state department a document which is worthy of wider reading. The document with the story of its origin is as follows:

> In the pocket of an old ragged coat belonging to one of the insane patients of the Chicago poorhouse there was found, after the patient's death, a will.
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> The man had been a lawyer, and the will was written in a firm, clear hand on a few scraps of paper. So unusual was it that it was sent to a lawyer, and he read it before the Chicago Bar Association, and a resolution was passed ordering it probated. And now it is on the records of Cook County, Illinois.
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> The will reads as follows:
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> "I, Charles Lounsberry, being of sound and disposing mind and memory, do hereby make and publish this, my last will and testament, in order, as justly as may be, to distribute my interest in the world among succeeding men.

"That part of my interests which is known in law and recognized in the sheep-bound volumes as my property, being inconsiderable and of none account, I make no disposition of in this, my will. My right to live, being but a life estate, is not at my disposal, but, these things excepted, all else in the world I now proceed to devise and bequeath.

"Item: I give to good fathers and mothers, in trust for their children, all good little words of praise and encouragement and all quaint pet names and endearments; and I charge said parents to use them justly, but generously, as the needs of their children shall require.

"Item: I leave to children inclusively, but only for the term of their childhood, all and every one, the flowers of the fields and the blossoms of the woods, with the right to play among them freely according to the customs of children, warning them at the same time against thistles and thorns. And I devise to children the banks of the brooks and the golden sands beneath the waters thereof, and the odors of the willows that dip therein, and the white clouds that float high over the giant trees.

"And I leave to the children the long, long days to be merry in, in a thousand ways, and the night and the train of the Milky Way to wonder at, but subject, nevertheless, to the rights hereinafter given to lovers.

"Item: I devise to boys, jointly, all the useful, idle fields and commons where ball may be played, all pleasant waters where one may swim, all snowclad hills where one may coast, and all streams and ponds where one may fish or where, when grim winter comes, one may skate, to hold the same for the period of their boyhood. And all meadows, with the clover blossoms and butterflies thereof; the woods with their appurtenances; the squirrels and the birds and echoes and strange noises, and all distant places which may be visited, together with the adventures there found. And I give to said boys each his own place at the fireside at night, with all the pictures that may be seen in the burning wood, to enjoy without let or hindrance or without any incumbrance or care.

"Item: To lovers I devise their imaginary world, with whatever they may need, as the stars of the sky, the red roses by the wall, the bloom of the hawthorn, the sweet strains of music, and aught else they may desire to figure to each other the lastingness and beauty of their love.

"Item: To young men, jointly, I devise and bequeath all boisterous, inspiring sports of rivalry, and I give to them the disdain of weakness and undaunted confidence in their own strength. Though they are rude, I leave to them the power to make lasting friendships and of possessing companions, and to them exclusively I give all merry songs and grave choruses to sing with lusty voices.

"Item: And to those who are no longer children or youths or lovers, I leave memory; and bequeath to them the volumes of the poems of Burns and Shakespeare and of other poets, if there be others, to the end that they may live the old days over again, freely and fully, without tithe or diminution.

"Item: To our loved ones with snowy crowns I bequeath the happiness of old age, the love and gratitude of their children, until they fall asleep."

DIFFICULTIES TO BE MET IN LOCAL CURRICULUM-MAKING

FRANKLIN BOBBITT
University of Chicago

In the matter of curriculum-making American cities are relatively autonomous. For the most part, each arranges its own courses.

There appears to be a general realization throughout the country that the education of the past is inadequate for the new conditions of a greatly changed society and that we must critically re-examine, reformulate, and extend our educational program. As a consequence, cities and villages from coast to coast are diligently working on this problem.

There is a rapidly growing realization that curriculum-making is not the simple perfunctory thing it used to be when a superintendent or a committee in a relatively short time could prepare a syllabus of subject-matter and drill exercises, largely in terms of the textbooks to be used. The tendency in any school system at present is to organize general committees for the different levels of instruction—elementary school, junior high school, and senior high school—and then at each level a working committee for each department. More and more, committees are organized with the expectation that the work will continue for several years before it is completed.

It is the belief of the writer that this method of procedure is in conformity with good principles of democratic school administration. Courses of study employed in a given city should not be handed down from some distant centralized agency. Neither should the school systems accept and adopt the pronouncements of the experts in the several fields. With the exception of a very few cases, pronouncements of an authoritative character do not yet exist, whatever may be said in favor of accepting them when they are formulated. Even if we had such authoritative advice, it would have to be applied to the practical conditions of the local situations.

The responsibility rests upon each city to educate its own chil-

dren. This involves responsibility for the planning of the education as well as responsibility for the conduct of the education. The educational plans will not be properly appreciated and understood if they are merely taken over from some outside source. Those responsible for the work come to realize the nature and intent of the plans through formulating them. Local curriculum-making, therefore, should be the method of arriving at the curriculum for any community.

It has been the observation and experience of the writer in his contacts with curriculum committees that they meet with many serious difficulties when they set to work. It is the purpose of this article to enumerate the outstanding obstacles and to present certain suggestions for overcoming them.

1. *Uncertainty as to the function of the school.*—Elementary schools appear to have been established originally for the purpose of aiding the pupils in acquiring a command of the tools of thought and communication—reading, writing, spelling, computation, and oral and written expression. Even now, in authoritative pronouncements of the twentieth century, these are called the "fundamental processes." At the other extreme, there is the conception that education has to do with guiding and conditioning the all-sided growth and development of the individual in his personal qualities, disposition, attitudes, habits, powers of judgment, vision of reality, and competence in discharging all of the responsibilities of efficient adulthood.

For the most part, the educational profession is between these two extremes. It is moving from the one toward the other. The different members of the profession, however, have been moving forward at different rates. Some have made but little advance, while others have gone far. If teachers and supervisory officers were all of one mind as to the general function of the school, it would greatly facilitate all of the labors.

2. *Traditions as to the aims or objectives.*—Tradition says that education consists of teaching the textbooks. For the content-subjects, it is a storing of the facts in memory. For the skill-subjects, it is a matter of artificial academic drill in relative, or more often complete, isolation from practical applications. It is coming to

appear that, in an improved type of education, information-mastery of the cold-storage, textbook type is to be a minor matter and that academic skills, not currently functioning in life itself, are likewise to play a diminishing part. Education is more and more to be accomplished through a carefully conditioned and carefully guided series of normal life-experiences. Some of these will be at school and some of them elsewhere. They will aim not at mere stores of inert information and unapplied academic skills of vanishing types but rather at abilities to do the things well which are involved in a proper type of human living. *To live as one ought to live* at each successive age-level is the *one* sure way of learning to live as one ought to live at the mature level of adulthood.

Teachers have long been accustomed to thinking in terms of subjects, textbooks, recitations, examinations, etc., all of which belong to the older traditional conception. Most of our educational machinery likewise tends to reinforce and maintain the traditional attitudes and valuations.

So long as the members of a curriculum-making committee have this attitude, the usual one, it is practically impossible for them to understand that specific abilities and activities are the aims and that the actual living of life as it ought to be lived is the way to learn to live it. Such suggestions seem so irrelevant and fantastic that curriculum committees cannot believe that a person is talking seriously when he urges such objectives and procedures for their consideration. They do not *refuse* to take it seriously; they are simply unable to do so. Their minds are tradition-bound. It seems utterly preposterous to them that any sane person can mean that education is anything other than the usual academic teaching of the familiar subjects. Only a few rare teachers, it appears, have achieved the necessary intellectual liberation.

3. *The primitive character of educational science with regard to educational objectives.*—Even the fundamentals of educational science are woefully undeveloped. This science does not yet tell us what the objectives of human education are. Neither does it tell us with authority what method is to be employed in order to discover these objectives with certainty.

The consequence of this situation is that each committee has to

start at the beginning of things and establish objectives without sufficient help from educational science. Lacking guidance, their thought naturally tends to fall into the familiar grooves of habit. They find themselves unable to conceive of objectives other than the usual academic objectives. Consequently, they tend merely to reformulate the same old-type curriculum. It will differ from previous formulations in date but scarcely in spirit or in content.

When science as it pertains to the objectives is developed, we shall probably discover that the objectives of education are the innumerable specific activities which constitute human life. At present, a curriculum-making committee in any city must make its own survey and analysis of community activities in discovering what these are. It is very laborious work, and the observation and experience of the writer indicate that it is very difficult for a curriculum committee to secure any clear idea of the kinds of abilities and activities which should be classified as objectives. Lacking the science, they lack even the basic concepts in terms of which to consider the problems.

It will not be possible for teacher-committees to make any great progress until they can have the intellectual guidance of a well-developed and well-understood educational science pertaining to objectives.

4. *Uncertainty as to educational methods or procedures.*—The nature of the educational methods to be employed is determined by the character of the ends to be achieved. If we conceive the end of the process to be the accumulation of textbook information, we shall employ the familiar methods of storing the memory with inert information. On the other hand, if we conceive the end to be right living in all of its manifestations, then we shall seek to organize opportunities for right living as the appropriate means of training. So long as there is uncertainty as to the goals, there must necessarily be uncertainty with regard to the steps to be taken, day by day, in attaining those goals. It is these steps which make up the curriculum.

5. *Traditions relative to the methods or procedures.*—While there is doubt in the minds of the relatively few who are really thinking about the problems, the large majority of the teachers employ the

methods dictated by tradition. They accept the subject-teaching objectives without question and then adopt the subject-teaching methods as a matter of course. Everything as it has been is assumed to be the right thing. Here and there, of course, even the blindest traditionalist will discover possibilities of improving his methods or devices in detail, but for him the fundamental assumptions remain unchanged. The weight of this tradition and the professional inertness of the great body of teachers who are controlled by it constitute a major obstacle in the way of rational curriculum-making. They cannot yet see the specific methods to be employed where living as one ought to live is the plan of learning to live as one ought to live. They must see this before they can formulate a modern curriculum.

6. *The subject-teaching fallacy.*—The subject-teaching fallacy is covered in the preceding paragraph, since it is one of the traditions that education consists merely in teaching the academic subjects. We must call special attention to this difficulty, however, since it is one of the central obstacles which, if dislodged, will remove many of the other obstacles.

So long as the members of a curriculum committee conceive their responsibility to be merely teaching a particular subject in academic isolation, they are unfitted for curriculum-making of the modern type. They cannot enter upon the labor of organizing their own departments until they can see human life and human activity as both the objectives of education and the means of education. Until the committee is prepared to see its problems without reference to traditional subjects, it is not prepared to formulate a curriculum of the functional or behavioristic type.

7. *The isolation of the school from the life of the community.*—More and more we are coming to see that education results from the pupil's right living, wherever he may be and whatever he may be doing. Subject-teaching education can ignore everything except study and recitation of the subjects. These are almost wholly school activities. Even when there is "home work," this home work is merely a device for extending the school work by using an hour or two of the pupil's time at home. It is "school work" in the sense that it is preparation for academic exercises and has no relation to the pupil's normal home activities.

Both in theory and in practice, education is discarding this academic tradition. It is coming to be believed, for example, that health education results from 168 hours of healthful living each week, that training in practical home arts results from practicing the home arts under the conditions of home responsibilities, that the ability to read comes from doing much reading under normal conditions with normal reading motives, that training for healthful leisure occupations results from participating in normal healthful recreations wherever these may be found within the community, that civic training is the result of living the life of the good citizen wherever one may be, and, in general, that competence in the performance of activities results from the proper performance of these activities under normal conditions. When this becomes our education, quite obviously the school cannot exist in isolation from the community life. It will be engaged in assisting the community to provide the conditions of right living for its children. Some will be provided at the school; but where social conditions are favorable, possibly more of them should be provided elsewhere.

Where schools are thoroughly traditional and isolated from community living, this doctrine is meaningless, and a curriculum committee is relatively helpless, except, of course, to do the traditional thing.

8. *Community habits, attitudes, and traditions.*—When any home function—for example, education—is institutionalized and taken over by a specialized agency, the latter, it appears, usually tries to expand its functions in order to assume responsibility as completely as possible. In the nature of the case, it seems that a specialized agency tends toward aggrandizement of function. On the other hand, in giving over the functions to the specialized agency, the home feels a sense of relief in transferring perplexing and laborious responsibilities. It is glad to see the functions taken over as fully and as completely as the special agency wishes.

As a consequence of the operation of this general tendency, schools have been taking over home functions very completely in the case of matters that can be managed at the school, and parents have been more than content to be relieved of their burdens. One's thinking consists largely of transforming wishes into rationalizations, and

parents have generously indulged in the process. Where wishes provide the motive power, it does not take long to build up strongly intrenched traditions. The community is content, therefore, to have education managed for them and their children in complete isolation from the general community life. They would like to believe that it can be done in that way, and, as a consequence of their wishes, they readily decide that it can be so done. In attempting even functional curriculum-making, therefore, the community will insist that the school do its work on the school premises and leave the home with no responsibility in the case. The curriculum-making committee which would employ normal living as a means of education will find this the most difficult and the most baffling of all of its problems. The community can scarcely be brought to consider the matter, as wishes are among the most potent of inhibitors to thought.

9. *The influence of the material facilities.*—Education has agreed that the basic teaching instrument shall be the textbook. During recent years it has had to concede that certain supplementary helps are desirable. But the very term "supplementary" carries with it the assumption that the textbook constitutes the basic instrument. The presence of these traditionally sanctioned and legislatively authorized teaching bases practically enforces the ancient subject-teaching conception. Professional progress, in the main, will have to be led by those cities which have retained their freedom to use the teaching helps which, in their professional judgment, appear to be the best.

Textbooks are not the only hindrances. The presence of manual-training shops equipped only for a stereotyped series of bench exercises in wood is an obstacle to the development of a functioning course in practical arts actually appropriate for the boys of today. The presence of an elaborately equipped domestic-science "laboratory" is an obstacle to the development of training for home cooking in the kitchens—not laboratories—of the community. The presence of the gymnasium suggests that the muscular exercise needed by the children can be provided for indoors at the school; it is a serious obstacle, therefore, to the realization of the fact that two or three hours of outdoor physical activity is needed every day in the year by every child and quite obviously cannot be provided for by the school. In the same way, other portions of the material equip-

ment enforce in subtle fashion the ancient traditions and stand as obstacles to curriculum-making committees in their consideration of the problems.

10. *The overspecialization of the teaching and supervisory personnel.*—Specialization on the part of teachers and supervisors takes a number of forms. To begin with, teachers and supervisors have a specialized understanding of the school and its functions in isolation from the community life. They know the school, but they do not know, in the same detailed way, the community life and the relation of the juvenile generation to the adult generation within this community life. They have specialized in the academic procedures of education but not in the social processes which are even more fundamental in the actual upbringing of children.

There is a strong tendency also to see even the scholastic education not as a whole but as a series of fragments. One who has specialized in intermediate-grade education has little or no interest in, or understanding of, the levels below and above. Likewise, on each of the levels from the kindergarten to the university, there is a group of specialists who know little and care little about the other levels. Furthermore, at any given level, more particularly in the later grades of the elementary school and at all of the higher levels, there is specialization in a single subject or department. The result is that the specialists at a given level are neither interested nor informed with regard to the totality of education at that level. Their professional vision is very restricted, indeed. They are specialists in subject-matter but not really specialists in *education*—the full, well-rounded upbringing of human beings.

A clear vision of functional education as a whole or in any of its parts is possible only to one who can view human life along its various lines and on its various levels *in its totality*. One needs this generalized vision of the life-processes in order properly to see the educational processes, for the two are one. Under the present conditions of intensive specialization, however, it is practically impossible to secure curriculum-making committees who have this generalized vision as a foundation for their judgments in performing their specific portions of the total task and in co-ordinating their labors with those of other committees. To develop a generalized vision of

education is a long, slow process. For those who have become crystallized through habit, it is impossible. This condition within the teaching and supervisory personnel stands as an almost insurmountable barrier to progress. This, more than anything else, is the key-obstacle that holds everything else tightly locked.

We need specialization, of course—intensive specialization—but it should be specialization in the right growth and development of human beings, which is quite different from the usual type.

11. *The members of curriculum committees lack the necessary time and energy for the work.*—Curriculum committees are made up of teachers, principals, and special supervisors. After the teacher's regular work is completed, there is neither time nor energy, under present conditions, for the long and virile thinking necessary for grappling with these problems of almost interminable complexity. A proper type of curriculum can never be made by those who have only remnants of time and energy to devote to it. This is to demand superhuman powers on the part of very human individuals.

When at the close of a day or a week or a term a committee of tired teachers comes together to work on their portion of the curriculum, it is practically inevitable that their thought will follow the easier grooves of habit. They are not in a mood for intellectual exploration. Ordinarily there is nothing within the situation to motivate non-habitual activities. The whole mental "set" of the tired individual takes the attitude and method of self-protection, and this is to drift along the easy channels of habit.

12. *Those who are in the position of general professional leadership are, for the most part, primarily directors of routine and only secondarily directors of professional thought and labor.*—In the operation of a building or of a school system as a whole, there is a large amount of necessary routine administrative labor. In the main, the principal or superintendent is expected to care for this routine. It is *hoped* that such general officials will perform their purely professional functions with great efficiency, but rarely is there any careful study of the situation to see whether the conditions make it possible for them to take charge of the routine and at the same time give adequate attention to matters of professional leadership and direction. As a matter of fact, rarely do these officials find conditions such that they can

attend *primarily* to their purely professional functions. This situation leaves the curriculum-making committees without that generalized leadership which is indispensable. Were they less specialized and less bound by habit and tradition, they might make a respectable contribution without such leadership. They are, however, greatly overspecialized—in part, wrongly specialized—and they are very completely bound by habit.

13. *The hesitation of institutions of professional research and training to take the lead.*—Within our teachers' colleges and schools of education there are obstacles to progress which are analogous to those existing within the public-school systems. At this level, too, there is uncertainty as to the general function of the school and as to the specific objectives at which it should aim. As a consequence, there is uncertainty as to procedures. There is confusion and diversity of thinking relative to the place of the various subjects in the curriculum and to the effectiveness of the usual subject-teaching. The professional institutions tend to think of the school in a specialized way and as isolated from the life of the community. The instructors are also intensively specialized and frequently have neither a vision of education in its totality nor interest in it. In large degree, they see education not as a social process but rather as schooling in relative isolation from the social processes. A considerable amount of authoritative work has been done along certain educational lines, such as spelling, arithmetic, handwriting, and reading. The institutions of educational research are able in these subjects to provide an intellectual leadership to working committees which is entirely authoritative. For the great bulk of the training, however, these institutions are as yet unprepared to provide curriculum committees with reliable leadership. This leaves the committees without a type of assistance which is almost indispensable, since the local community is not so situated as to be able to carry on the necessary research. They need a kind of help from experts which the latter are not yet prepared to give.

In presenting these many obstacles to successful curriculum-making, it is not the intention of the writer to discourage local workers but rather to assist them in overcoming the difficulties. One must see clearly what the difficulties are and how serious they

are before one is prepared to overcome them. Not one of the difficulties is insurmountable.

It is the belief of the writer that those responsible for education in the local community should plan educational labors for the local community. They should not take their plans and their thinking—or their substitutes for thought—as handed down from above, whether from experts or from centralized governmental agencies. They should bear the full responsibility of planning their own work in the light of their own conditions. Naturally, if they are wise, they will secure every possible suggestion from experts and central agencies and utilize them in solving their own practical problems. They will adapt all such suggestions to their special situation as they find it, and they will make their own decisions.

One practical suggestion may be made concerning the mode of attack on these difficulties. The key-obstacle, upon which all of the other obstacles depend, is the outworn concept of the nature of education, which is held in some degree by those who bear responsibility, original or derived, for the right upbringing of children. This ancient conception is to be removed, not by attacking it, but rather by showing the modern behavioristic conception with all possible clearness. The latter does not have to be argued; it needs only to be clearly seen and understood.

Let the profession on all of its levels, from the kindergarten to the college, specialize intensively in *education*—that is, *the right upbringing of human beings*—rather than in subjects and the mere thoughtless teaching of subjects. Let it give its vision over to the alert laymen of the community, who need only to see in order to be convinced. Then, when lay and professional men have modernized their conception of the objectives and procedures of education, the key-obstacle to progress will have vanished as darkness before light. With this obstacle removed, the other obstacles can be speedily dislodged.

ARITHMETIC ONE HUNDRED YEARS AGO

E. R. BRESLICH
University High School, University of Chicago

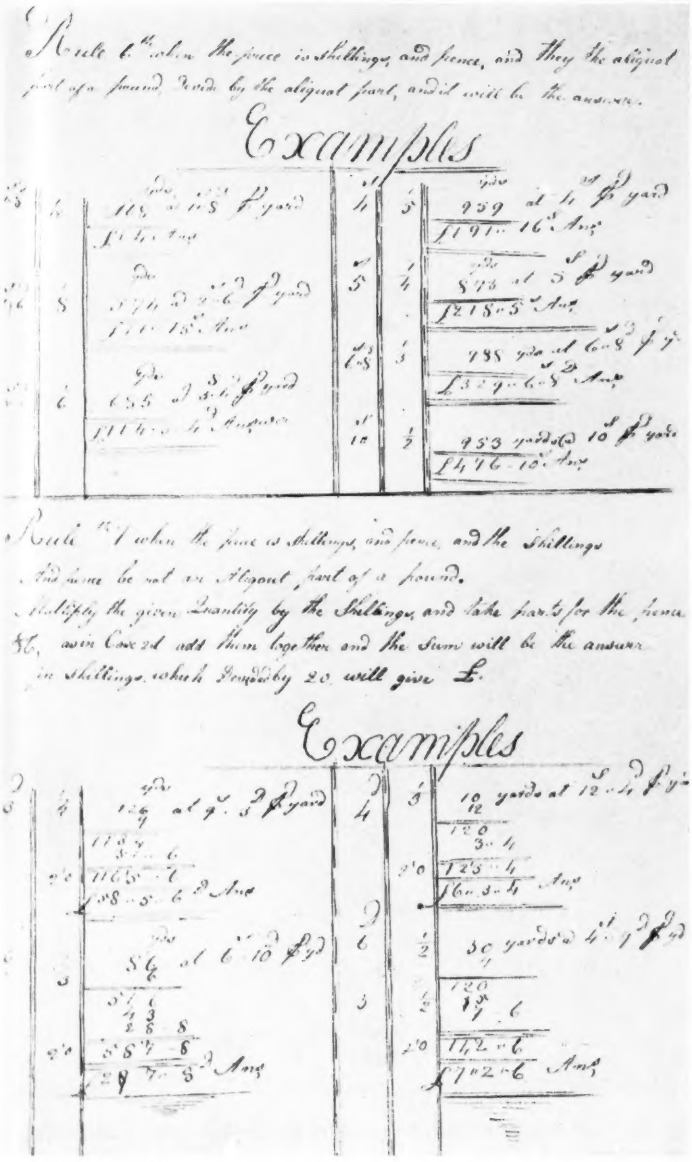
Up to the nineteenth century arithmetic was a very much neglected subject. It was looked upon as inferior to other school subjects. Indeed, it was hardly considered an important factor in a liberal education. The subject taught but little more than mechanical manipulation of figures and was attractive only to commercial classes. As a result, pupils in general remained ignorant of the art of computation.

In the first quarter of the nineteenth century the subject began to undergo changes. The reforms initiated by Pestalozzi and carried forward by his followers brought about a complete readjustment of the course. However, the real reform in the teaching of arithmetic in the United States began when Warren Colburn published his *Intellectual Arithmetic* in 1821. From that time until today the process of improving the methods and content of the course has gone on without interruption.

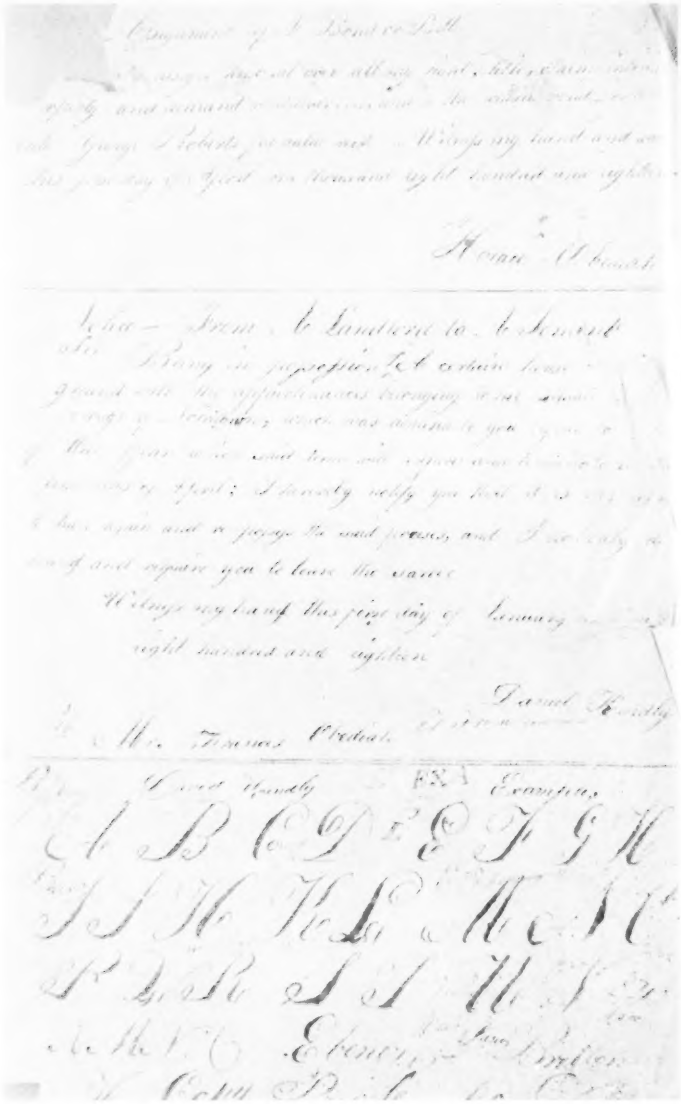
How great these improvements are is seen from a comparison of present-day arithmetic with work done by pupils one hundred years ago. A very good idea of the earlier course was obtained by the writer from an examination of two cipher books, borrowed from a private library, containing the work of two pupils who studied arithmetic in Illinois in the years from 1804 to 1808. The following are some of the outstanding characteristics of the arithmetic course at that time:

1. Arithmetic was essentially a study of rules, dogmatically stated, to be used in solving problems (Plate I).

2. Work in arithmetic was practically all written. A great deal of attention was given to fancy writing (Plates II and III). Each pupil copied in artistic fashion the topics and the rules and arranged all solutions of the examples in attractive form (Plate III). The

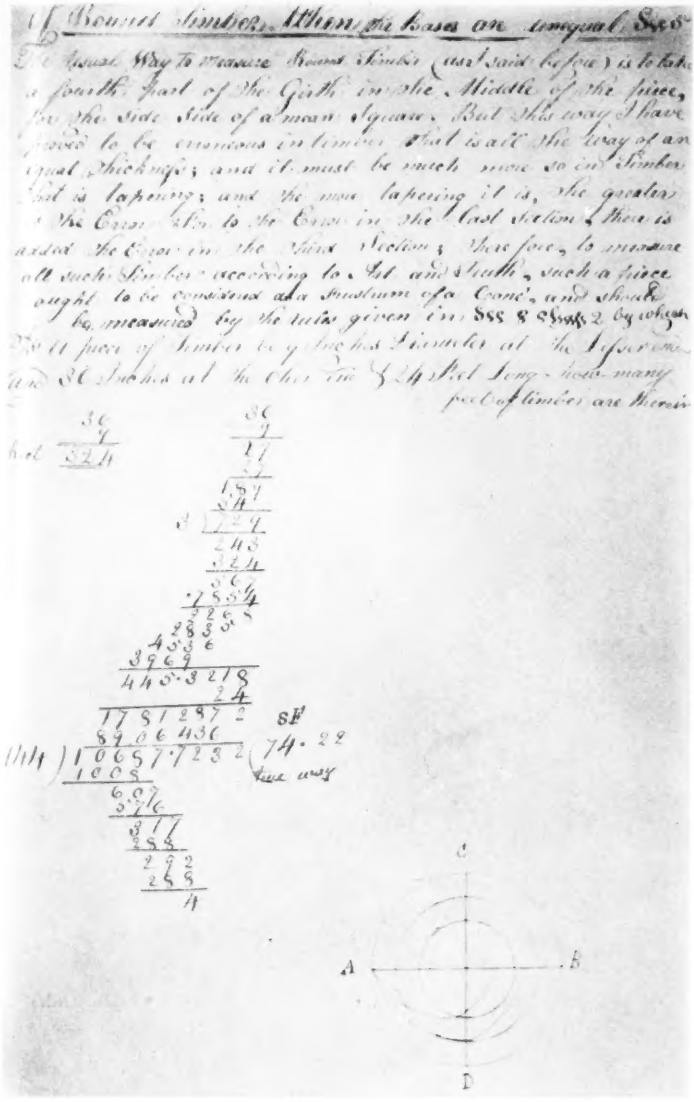

Rule 6th when the price is Shillings and pence, and they the aliquot part of a pound. Divide by the aliquot part, and it will be the answer.
Examples
Rule 7th when the price is Shillings and pence, and the Shillings and pence be not an Aliquot part of a pound.
Multiply the given Quantity by the Shillings, and take parts for the pence &c, as in Case 2d add them together and the Sum will be the answer in Shillings, which Divided by 20 will give £.
Examples

This page shows the use of rules in solving examples. Note the careful arrangement of all work.



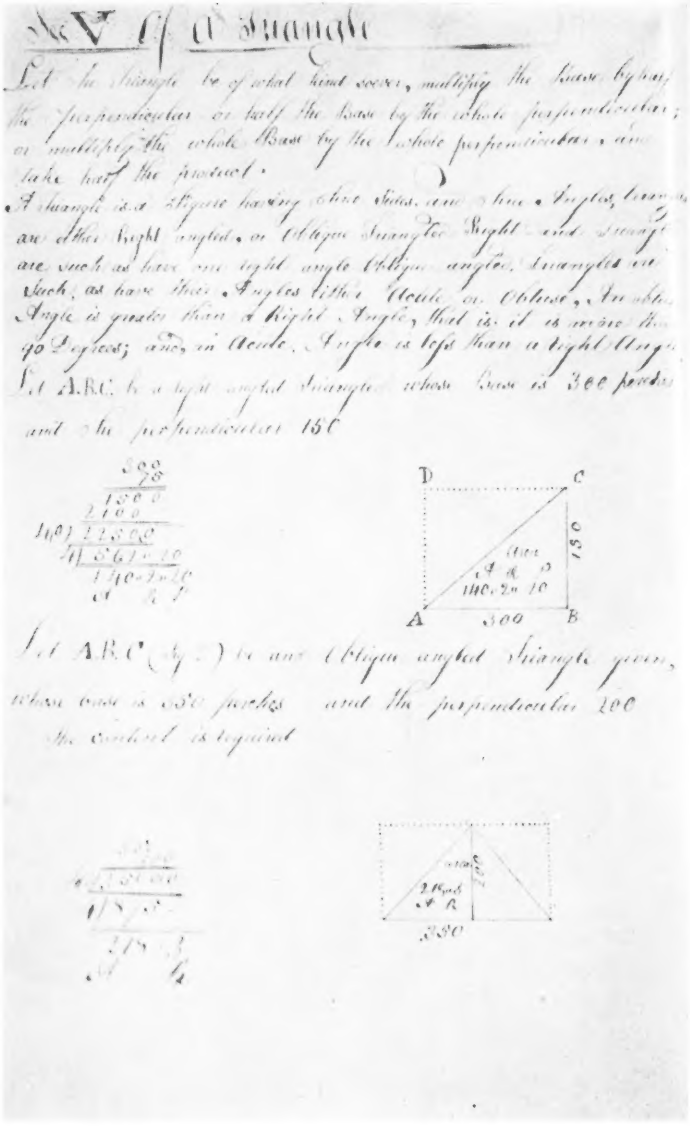
This page shows how skill in fancy writing was developed in connection with the study of arithmetic.

PLATE III



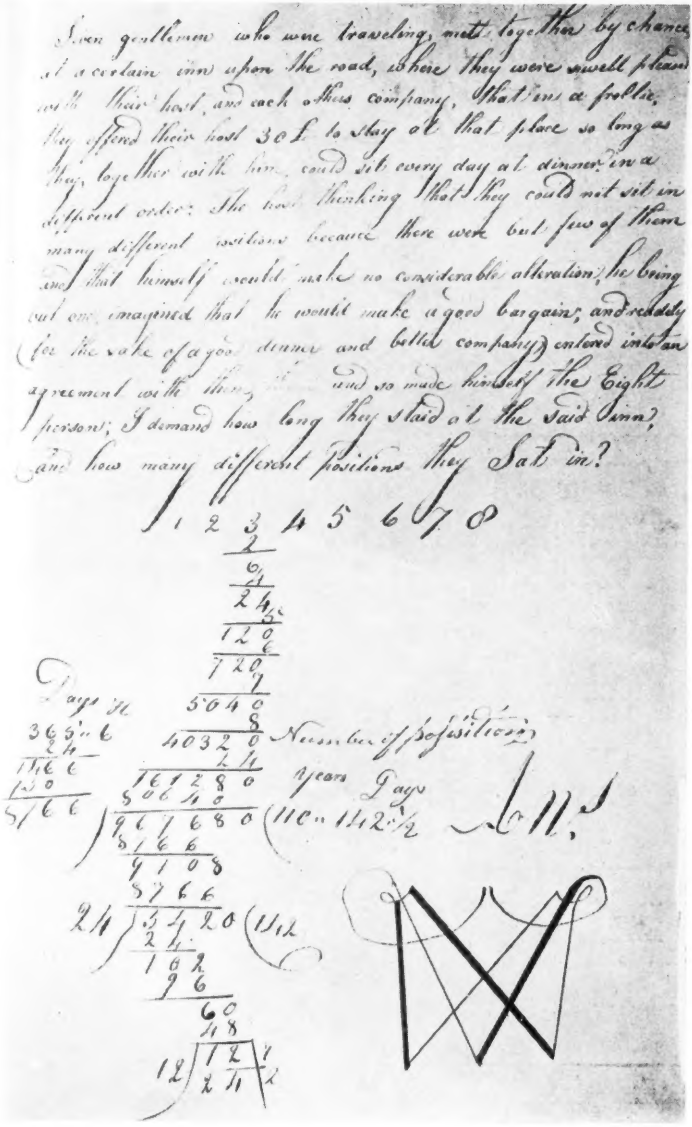
An example of vocational arithmetic. Note the changes of style in writing, the perfect arrangement, and the details in multiplying 36 by 9 with the word "product" written before the result.

PLATE IV

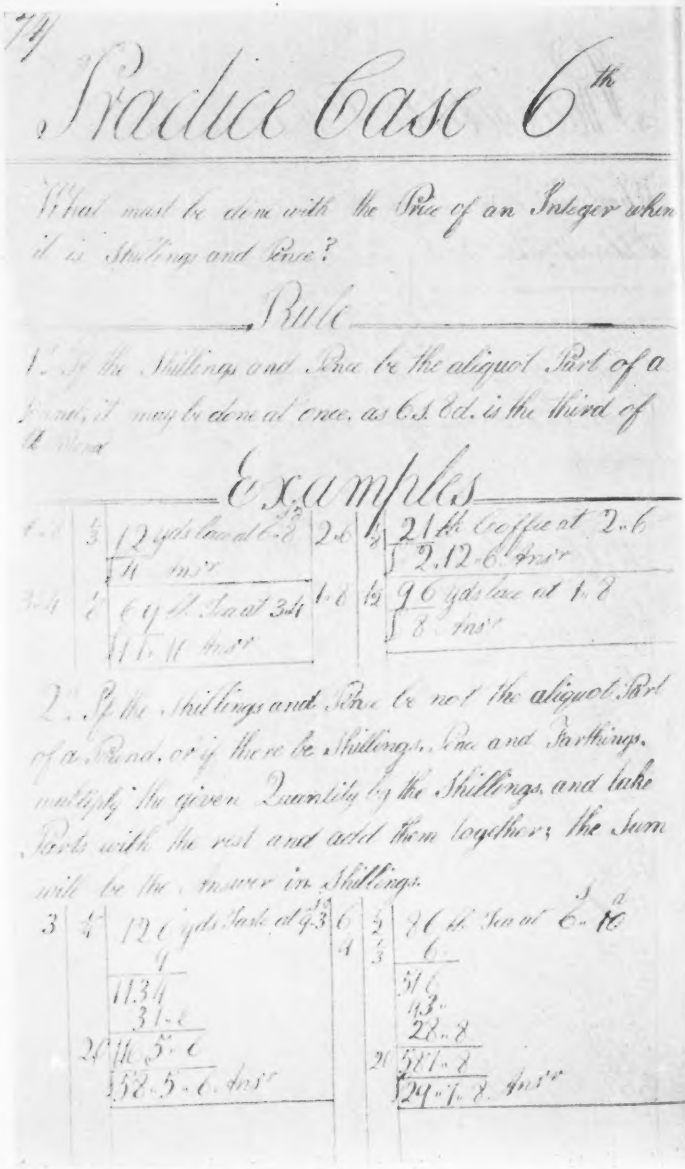

Area of a Triangle
Let the Triangle be of what kind soever, multiply the base by half the perpendicular or half the base by the whole perpendicular; or multiply the whole Base by the whole perpendicular, and take half the product.
A triangle is a figure having three sides, and three Angles, and are either Right angled or Obligue Triangles. Right angled are such as have one right angle Obligue angled Triangles are such as have their Angles either Acute or Obtuse, An obtuse Angle is greater than a Right Angle, that is it is more than 90 Degrees; and an Acute Angle is less than a right Angle
Let ABC be a right angled Triangle whose Base is 300 perches and the perpendicular 180
300
28
1800
2400
140) 12840 (
91
560
540
40
A
D
C
180
A
B
300
Let ABC (fig 2) be an Obligue angled Triangle given, whose base is 350 perches and the perpendicular 200 the Content is required
350
200
175
25
2)17500
8750 A
A
B
350

Note the care in computation and drawing and the inaccuracies in both drawings. The first triangle should have one side of the right angle twice as long as the other, and the second triangle was not to have a right angle.

PLATE V



Note the tedious computation, the careful writing, and the numerous errors in English.



74

Rule Case 6th

What must be done with the Price of an Integer when it is Shillings and Pence?

Rule

1. If the Shillings and Pence be the aliquot Part of a Pound, it may be done at once, as 6s 8d. is the third of a Pound.

Examples

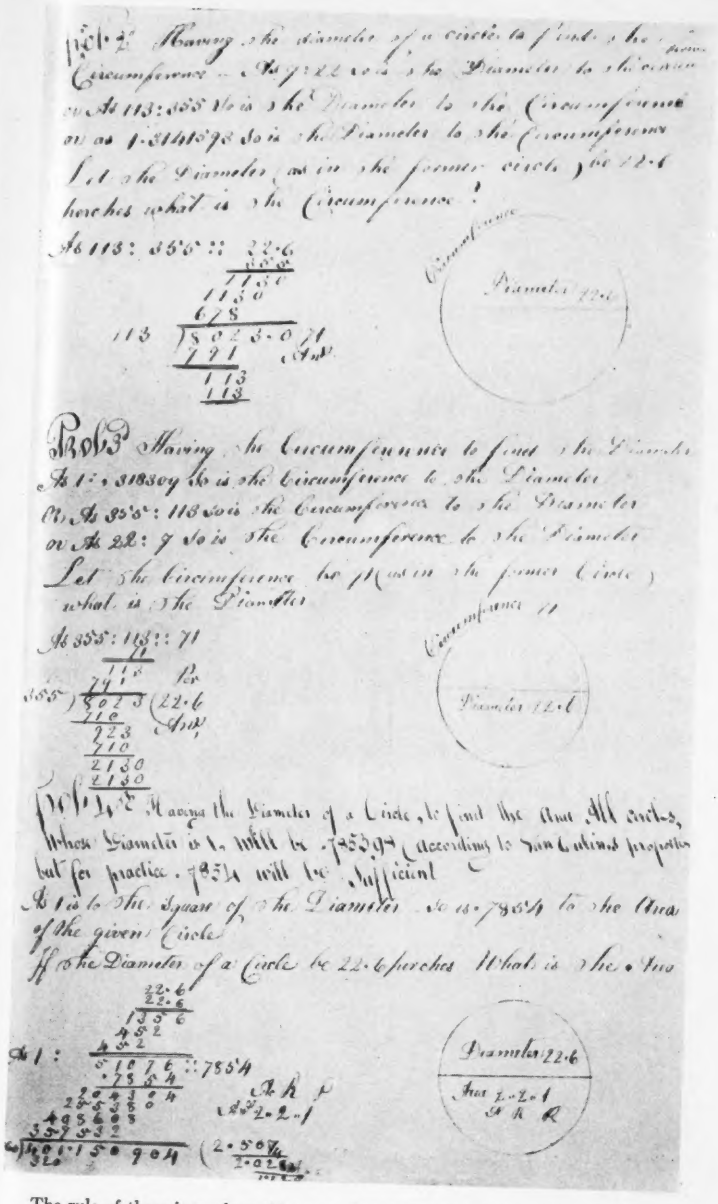
1-8 | 3 | 12 yds Lace at 6-8 | 2-6 | 4 | 21 lb Coffee at 2-6
4 ins^r | 2.12-6 Ans^r
3-4 | 4 | 6 yd. Tea at 3-4 | 1-6 | 12 | 96 yds Lace at 1-8
11-6-8 Ans^r | 8 Ans^r

2. If the Shillings and Pence be not the aliquot Part of a Pound, or if there be Shillings, Pence and Farthings, multiply the given Quantity by the Shillings, and take Parts with the rest and add them together; the Sum will be the Answer in Shillings.

3 | 4 | 12 yds Stuff at 4-3 | 6 | 5 | 76 yd. Tea at 3 | 8-10-8
4 | 3 | 6
11-3-4
3-1-8
20 | 14-5-0 | 20 | 511-8
532-5-0 Ans^r | 25-11-8 Ans^r

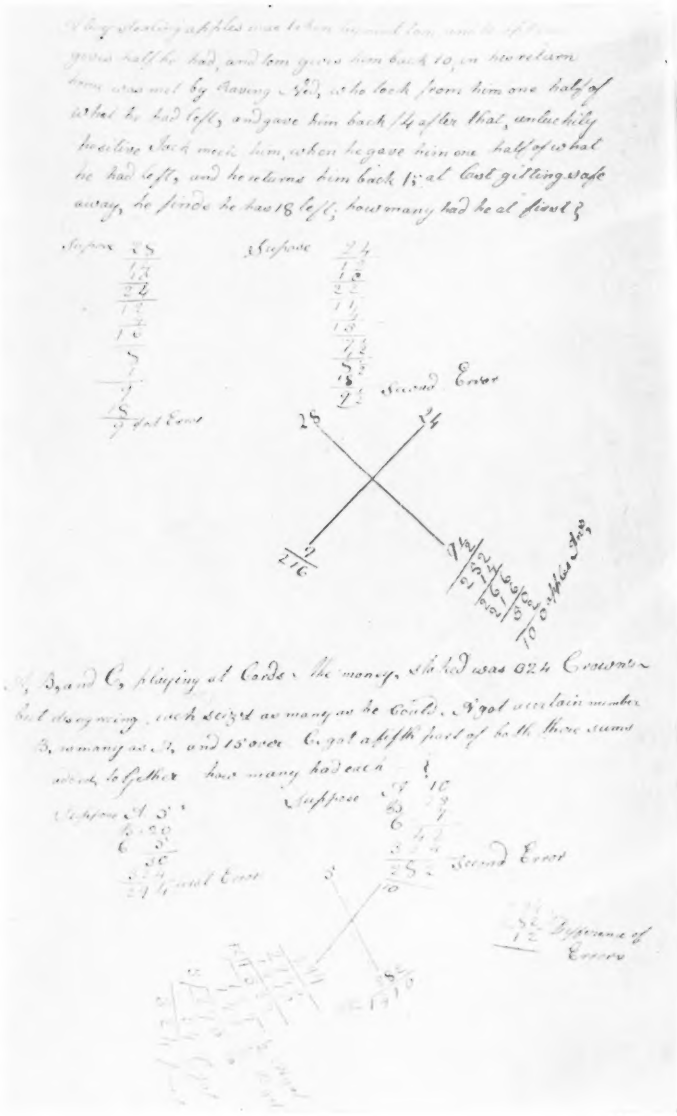
This page shows how the topics were divided into cases. Note the brief introduction to this case.

PLATE VII



The rule of three is used on this page. In modern arithmetic we would solve the equation $\frac{c}{d}=\frac{22}{7}$ for either c or d and the equation $A=\frac{\pi}{4}d^2$ for A or d^2.

PLATE VIII



This page shows how answers to problems were deduced from chance suppositions.

tendency to do all work in writing was so marked that sometimes the simplest operations were written out in full (Plate III). Thus, in the solution of one problem we find the following operations which could have been carried out mentally:

18	9	3)14.25
9	9	4.75
9	3)81	
	27	

3. Most of the prominent topics are now obsolete. Present-day arithmetics do not contain discussions of alligation, true discount, equation of payments, exchange, barter, tare and tret, the rule of three, single and double position, compound proportion, etc.

4. Commercial topics were predominant, because the subject was studied largely for commercial purposes. In that sense it was suited to the demands of the time as well as modern courses are adapted to present-day life.

5. The amount of arithmetic actually taught was small. For example, only the most elementary notions of fractions were studied, and but little work with decimal fractions was offered.

6. Besides the commercial arithmetic there was a considerable amount of work relating to the vocational problems encountered by glaziers, masons, painters, plasterers, carpenters, roofers, lumbermen, and street pavers (Plate III).

7. The vocational applications involved some geometry, both plane and solid, concerned mostly with surface measure and content of solids. This called for measurement of the triangle (Plate IV), rectangle, square, circle, pyramid, cylinder, frustrum of a cone or pyramid, and sphere. No formulas were developed, and all problems were solved by applying rules (Plate IV).

8. A few topics that were not of the vocational type were studied. They were probably introduced because the teacher was interested in them and wished to pass them on to his pupils to arouse their interest. Problems involving topics of this type dealt with permutations, arithmetical and geometrical progressions (Plate V), and the rate of transmission of sound. Only a few exercises on each were given, and no formulas were developed. Thus, in introducing the

problems on sound, the pupil was told: "Sound, not interrupted, is by experiment found uniformly to move about 1,150 feet in one second."

Method of teaching.—In general, the procedure of teaching a topic seems to have been about as follows. The topic was stated. Then followed an explanation of the meaning of the topic. Usually new terms were introduced at this time. For example, in taking up the study of interest the pupil was told: "Any sum of money being lent out upon consideration of receiving the same again, with a premium from the borrower for the use of it a certain time, is said to be put out at interest and the interest is usually rated by the 100 £. The sum let out is called the principal. Interest is the premium or allowance for the use of the principal. The rate is the interest of a 100 £ for one year. The amount is the principal and its interest together."

After the definitions were given, the pupil proceeded at once to the examples. They were classified according to cases (Plates I and VI), with a special rule for each case. Thus Case I in interest read as follows: "To find the interest of any sum of money for a given number of years. Rule: Multiply the principal by the rate per cent. That product divided by 100 will give the interest for a year, which is multiplied by the number of years given, and the product will be the answer." Several examples were then worked out in detail. Each was carefully proved, and the next case was taken up.

The written work in the cipher books shows no attempt to rationalize the rules or to establish validity. The rules were given simply for the purpose of obtaining the answers to the problems by mechanical manipulation.

Rationalization.—Rationalization, which plays such an important part in the modern teaching of arithmetic, seems to have been unknown. Nor were there any real attempts to lead up to new concepts inductively. Sometimes reasons and explanations were given after the facts and rules had been taught, as indicated by the following footnote to the rule for problems in "Exchange": "For directions in the following cases see Master Delworth's assistant."

There were a few attempts to lead up to the meaning of a new term or to a new case or rule (Plate VI) by an introductory statement or remark, as shown by the following:

1. One of the cases in multiplication was introduced by the question: "What do you observe in the second case in multiplication?" The question was not answered, but the rule for the new case was presented: "When the multiplier consists of more figures than one, you must make as many products as there are figures in the multiplier, observing to place a figure back for each figure in the multiplier to the left hand." Apparently it was aimed to call attention to the fact that the distinction between the second case and the third lies in the number of figures contained in the multiplier.

2. Before the new terms used in division were named and defined, the question was asked: "How many parts does the division contain?" Then followed statements giving the meaning of the terms "dividend," "divisor," "quotient," and "remainder."

3. Occasionally a motive for learning a process was given, as in the following: "When the divisor is more than 12, for the help of memory, we are obliged to . . . . and this is called long division." It seems that the teacher found it helpful at times to call attention to the purpose of a new rule.

4. Another type of appeal to the pupil was to show him that the most recent methods were being taught. Thus, at the end of a proof for long division, we find the statement: "Note that the above method of proving division is the best that has ever yet been made known."

Although the foregoing examples are exceptions—in fact, the only illustrations of that type found in the books—they indicate an effort to avoid being entirely dogmatic. Beyond that, no explanations or proofs were attempted. The reason for this may have been that suitable proofs which could be adapted to the learner's ability had not yet been developed.

Mental training not a major purpose of the course.—Every effort was made to eliminate mental work. All the problems were classified under the rules which would give the solution. Thus one of the most difficult problems in the modern teaching of arithmetic, the choosing of the right operation, was entirely avoided. Occasionally it was explained why a certain operation was used. "When is multiplication used?" "When great names are to be brought into small" (Plate VI).

Satisfactory evidence of the correctness of results was always secured by proofs. The proofs consisted in reversing the process, in casting out nines, or in using a second method of working the problem. In every case proofs were given in the form of rules. For example, the following rule was a proof for multiplication: "To prove multiplication cast the nines out of the multiplicand and multiplier and put the excesses to the left and right sides of a cross—cast the nines out of their sums and place the excess at the top—lastly cast the nines out of the product and place the excess to the bottom. If top and bottom agree, work is right, otherwise wrong."

Poetry in arithmetic.—It must have been difficult to remember the large number of rules. To make learning easier, some of them were stated in verse. Perhaps this was also the result of attempts to make the subject attractive, for some problems were written in the form of poetry. The following are a few specimens:

The process of extracting the cube root was labeled, "A Rule to Get by Head." The poem was twenty lines long and rather bad poetry, as a few lines will readily show:

> The cube of your first period take
> and of its root a quotient make
> which root into a cube must grow
> and from your period taken fro.
> To the remainder then you must
> bring down another period just, ...

The following well-known poem might be considered a success, as it has survived, with some modifications, and is found in textbooks of today:

> 30 days hath September
> April, June, and November
> All the rest hath 31
> Except that short month February alone,
> Which to itself claimes but 8 and a score
> but in every leap year we give it one more.

The following are samples of problem poems:

> Whereas an eagle and a cent just three score yards did buy
> How many yards of that same cloth for 15 dimes had I?

Suppose, sir, a bushel be exactly round
whose depth being measured 8 inches is found
If the breadth being 18 inches and a half you discover
the bushel is legal all England over.

But a workman would make one of another frame
Seven inches and a half must be the depth of the same
Now, sir, of what length must the diameter be
that it may with the former measure agree?

The following poem is a simple application of the theorem of Pythagoras:

A castle wall there was whose height was found
to be a 100 feet from top to ground.
Against the wall a ladder stood upright
of the same length the castle was in height
A waggish youth did the ladder slide
(The bottom of it) 10 feet from the side
Now I would know how far the top did fall
by pulling out the ladder from the wall.

When put into prose the problem would probably be stated as follows: A 100-foot ladder (note the great length) rests against a wall of the same height. If the foot of the ladder is 10 feet from the wall, how far does the top of the building extend beyond the top of the ladder?

Apparently the length of a problem is considerably increased by making a poem of it. It took fourteen lines of poetry to state this rather simple problem:

A man that was idle and minded to spend
both money and time went to drink with his friend, ...

During the next nine lines he imbibes a considerable quantity, and then the story ends:

to cast up his reckonings, but his head being sore
he begs you to do it, and he will do so no more.

Shortcuts.—Occasionally there was a suggestion which aimed to save time and effort. Thus the pupil was told: "When the figures 1 and 1, or 1 and 2, or any number between 12 and 20 happen to be together in the multiplier you may multiply by both at once." Accordingly, in the problem $\begin{array}{r} 64242 \\ \times 412 \end{array}$ the pupil multiplied by 2 and

added at the same time to the product the number to the right in the multiplicand. The work in full was as follows:

```
  64242
    412
  ------
 770904
256968
------
26467704
```

In another place we find a suggestion for multiplying by a number that may be decomposed into factors: "To multiply by numbers that can be measured by the table, it is shorter, easier, and more concise to multiply by one of these and then by the other." It is difficult to see how it is easier to multiply by 5 first and then by 7 instead of multiplying by 35 in the usual way.

How topics were divided into cases.—It has been said that as soon as the meaning of a new topic was explained, the topic was at once divided into cases (Plate VI). The following examples illustrate how this was done:

1. *Multiplication.*—Case I: The multiplier contains one figure. Case II: The multiplier contains two figures. There were special rules for multipliers between 10 and 20 and for factorable multipliers. Case III: The multiplier contains a cipher, as 20, 205, etc. Case IV: The multiplier contains any number of figures. For each case a special rule was provided, and sample problems were worked out.

2. *Interest.*—Problems in finding interest were classified according to the time involved, that is, one year, any number of years, a year and a fraction of a year, and weeks, months, or days. Other cases were finding the principal, the time, or the rate. A number of special devices were introduced. For example, to find the interest for 5 years and 5 months, the interest was computed for 5 years, 4 months, and one month, or for 5 years, $\frac{1}{3}$ of a year, and $\frac{1}{4}$ of $\frac{1}{3}$ of a year. The computation was arranged as follows:

Interest for 1 year=	194766
	5
Interest for 5 years=	973830
Divide by 3:	64922
Divide this by 4:	16230
	1054982

3. *Fractions.*—(1) Reducing a fraction to the lowest terms. The Euclidean method of finding the factor common to the numerator and the denominator was taught, and the fraction was then reduced by dividing both terms by the highest common factor. (2) Reducing a whole number to a fraction with a given denominator. (3) Reducing a mixed number to a fraction. (4) Reducing an improper fraction to a proper fraction. (5) Reducing a compound fraction to a simple fraction. For example, to find $\frac{1}{2}$ of $\frac{2}{3}$ of $\frac{3}{4}$, all numerators were multiplied and all denominators were multiplied, giving the result $\frac{6}{24}$. This was then reduced to the lowest terms. (6) Reducing a fraction of an integer: for example, reducing $\frac{1}{96}$ of a shilling to a fraction of a farthing. (7) Reducing a vulgar fraction to a fraction of the same value with a given denominator. (8) Reducing a vulgar fraction to a fraction of the same value with a given numerator.

There was very little work in operations dealing with fractions. The methods for adding and multiplying were rather clumsy. For example, to multiply $3500 \times 1\frac{3}{4}$, the work was as follows:

Multiplicand:	3500
Multiplier:	$1\frac{3}{4}$
Multiply by 1:	3500
Multiply by $\frac{1}{2}$:	1750
Multiply by $\frac{1}{4}$:	875
Product:	6125

Topical outline of the course.—It was stated that the commercial subjects were the most prominent. The following topics are of this type: (1) interest, simple and compound, (2) rebate or discount, commission, (3) partnership, (4) fellowship and compound fellowship, (5) promissory notes, brokerage, (6) barter, (7) tare, tret, and cloff (allowance made to buyer for weight of box, bag, or container), (8) loss and gain, (9) insurance, (10) exchange, (11) annuities, (12) equation of payments.

A number of topics, although not commercial, were needed in the solution of commercial problems. For example, in the timber industry problems arose which called for a considerable body of geometrical facts. In particular, the pupil had to know how to compute areas and volumes of prisms, pyramids, and cones. No attempt

was made to work out formulas, but rules were given for the solution of problems. The following topics are of this type: (13) areas of triangles, squares, rectangles, and circles, (14) square root and cube root, (15) volumes of prisms, pyramids, cones, cylinders, spheres, and frustrums of pyramids and cones.

(16) Some topics were concerned with the arithmetical operations: multiplication, division, compound multiplication, compound division.

(17) Measures and weights. Since measures and weights were introduced from England, much time had to be spent in learning the different kinds of units and how to deal with them. Thus in the case of addition alone there were such topics as land measures, cloth measure, time, apothecaries' weights, Winchester measure, dry measure, long measure, and liquid measure.

(18) Reductions. It was frequently necessary to reduce one unit to another or to reduce one denomination to another. A large amount of the pupil's time was taken up with mastering these reductions. They were subdivided into reduction ascending and reduction descending. It was pointed out to the pupil that the former term was objectionable because we do not "reduce" when small units are expressed in terms of larger units, as when shillings are expressed in pounds. Hence, in the problems terms like "change into" or "bring into" were used. In one place the pupil apparently forgot and wrote, "Reduce 44871 Qrs. into pounds." This was criticized by the reader, who wrote in the margin, "Wm. Printer was wrong when he made use of the word reduce."

(19) Some of the minor topics having only a few problems in each case are arithmetical progression, geometrical progression, and sound.

(20) Rule of three or proportion. This rule was considered a universal rule for problem-solving. It taught how to find from three given numbers a fourth in proportion with them. As in direct and inverse proportion, two rules were taught. Because of its importance, this rule was explained more fully than any other. In the language of the book, the meaning of the rules was taught as follows:

> If more requires more, or less requires less the question belongs to the rule of three direct. But if more requires less and less requires more the question

belongs to the rule of three inverse, which may always be known from the nature and tenor of the question.

If 2 men can mow a field in 4 days, how much time will 4 men require?

Answer: 2 days. Here more requires less, viz., the more men the less time is required.

If 4 men require 2 days how much time will 2 men require?

Answer: 4 days. Here less requires more.

RULE

State and reduce the terms.

Multiply the first and second terms together and divide the product by the third. The quotient will be the answer in the same denomination as the middle term was reduced into.

The rule was used in the majority of the problems, for most of the problems involved relations that could be expressed in the form of a proportion. The symbolic form for the rule was: 1:1.4::15.9 (Plate VII). In modern symbols of algebra this would be: $\frac{1}{1.4}=\frac{15.9}{x}$.

(21) Rules of single and double position. Starting from chance suggestions, these rules deduced the correct answer (Plate VIII).

Problems.—Most of the problems were practical for the time in which they were studied. They were largely concerned with buying and selling articles, sometimes in small quantities as needed for the household and frequently in large quantities as in the case of large shipments. The articles bought or sold were bread, sugar, tea, coffee, wine, butter, beef, pork, potatoes, bacon, cheese, soap, snuff, tobacco, books, muslin, lace, tape, silk, cloth, steel, lead, gold, silver, oil, and coal. Most of the problems were taken from adult life, from commerce and trades. For example, the problems of the carpenter dealt with flooring, partitioning, and roofing.

Certain business forms were taught without problem work, as an assignment of a bond and a notice from the landlord to the tenant to vacate (Plate II).

There were also many artificial problems of the type found in modern textbooks, such as the following: "If the sum of two numbers is 45 and the product 450, find the numbers." "Divide 15 into two parts that when the greater is multiplied by 4 and the less by 16 the products are equal."

All problems were stated in full by the pupil. The solutions were

always carefully written, and proofs were given. Hence there were scarcely any errors in computation. However, errors in spelling, capitalization, and punctuation were numerous and seem to have been unchallenged by the reader (Plate V). Emphasis was on the quality of writing with little attention to the mechanical phases.

The story told by the notebooks of these two pupils shows that one hundred years ago arithmetic was a subject which aimed to accomplish little more than to develop ability to compute, to solve problems of adult life, and to perform operations in a purely mechanical way. It did not make any claims with regard to formal cultural value or training in general citizenship. It is less than one hundred years ago that modern methods of teaching arithmetic were introduced in the elementary schools of the United States. In this comparatively short period of time the subject has been completely revolutionized. The enormous progress and growth are not unlike the tremendous development which has taken place in the fields of invention and industry.

A STUDY OF FOUR PRIMARY MENTAL TESTS

ADA B. VIELE
Bureau of Educational Research, University of North Carolina

Under conditions as they exist in most of the public schools in North Carolina today, fully one-half of the children are misfits in the grades in which they have been placed. With her subject-matter and methods adapted to the average pupil in her room, the teacher must try to "hold down" those who have not enough to do and to keep from utter discouragement those who understand little or nothing of what she is teaching.

Group instruction as it is now widely practiced rests on the assumptions that all children when they arrive at the age of six (or whatever the legal age of school entrance may be) have practically the same funds of general knowledge and that all those who are not feeble-minded can and should make the same progress through the school grades. These assumptions are obviously false.

In schools so fortunate as to have supervisors and teachers who are thoughtful and aware of these problems, attempts are being made to reclassify the least homogeneous groups in the grammar grades by the use of standard tests. Even in these schools, however, many pupils who have been held back because they were "too young" for certain grades have already developed habits of laziness; others, because they were led to believe that schooling was not for them, have already formed a distaste for school.

Adjustments in grouping should be made whenever necessary; the more frequently in the child's school career, the better. Conditions as they are have demonstrated the importance—even the necessity—of having some basis other than chronological age for the classification of pupils at the very beginning of their school lives. Administration of the so-called intelligence tests especially designed for beginners seems now to be the most satisfactory solution.

In Roanoke Rapids, North Carolina, in the spring of 1924 a group of primary teachers who were members of an extension class

in educational measurements undertook to gather data for a study of the relative usefulness of several of the better-known primary mental tests.

The range of the amounts of knowledge possessed by school children is probably smaller in the first grade than in any other school grade. Superiority of mental equipment means, in general, greater rate of growth in knowledge, and, as children have ever increasing experiences and opportunities to learn, the difference between the knowledge of the slow child and the knowledge of the brilliant one grows greater and greater. For this reason, a first-grade teacher's judgments of the mental abilities of her pupils, whose amounts of knowledge do not vary greatly, would be less accurate, probably, than the seventh-grade teacher's judgments of the relative abilities of her class, in spite of the fact that the seventh-grade class is, with respect to native ability, a much more highly selected group.

Each teacher, however, felt that if she had only known at the beginning of the school year as much about the academic abilities of her pupils as she then knew, after daily contact with them during eight months of instruction, the pupils might have been more adequately classified, the teaching more effective, and the children more interested and happy in their school work. Hence, the teacher's estimate of her pupils' abilities to learn first- or second-grade subjects was taken as the standard by which to judge the usefulness of the primary mental tests.

In obtaining these estimates, a long sheet containing spaces for the name and ratings of each pupil was given to each teacher, with the following directions:

> List below in alphabetical order the names of all pupils belonging to the group. Indicate in the first blank column the relative intellectual *abilities* of these pupils in academic school work. Rate the best pupil as 1, the next best as 2, and so on down to the most stupid pupil. In case two or more pupils seem to you to be equally intelligent, flip a coin to decide which one will be given the higher rating.
>
> Indicate in the second blank column the relative amounts of *effort* or application exhibited by these pupils in their school work. Try to make your ranking for effort indicate clearly which pupil is most industrious (1), which next most industrious (2), and so on down to the laziest pupil. Let chance decide in any case where you cannot determine which of two pupils deserves the higher rating.

The sheets containing the teachers' judgments were, in most cases, completed and filed before the testing was done so that the ratings would, so far as possible, be unaffected by scores made on the tests.

The tests chosen for special consideration were the Cole-Vincent Group Intelligence Test for School Entrants; the Dearborn Group Tests of Intelligence, Series I; the Detroit First-Grade Intelligence Test; and the Pintner-Cunningham Primary Mental Test. The materials of these examinations, of necessity non-verbal and differing considerably one from another, include tests of range of information by means of recognition of objects and relationships between objects, tests of keenness of observation by detection of absurdities and differences in size and recognition of the component parts of pictures when disjoined, maze-threading, symmetrical completion of diagrams, and following of directions. In particular, the Dearborn test in its subject-matter seems to follow more closely than the other three tests the Stanford Revision of the Binet-Simon Tests.

No special training was given the teachers in the methods of administering these tests, although all teachers were given general instructions about following the printed directions carefully. Each teacher tested her own pupils by means of the chosen tests and marked the papers.[1] The scores were carefully recorded, and the test records, together with the teachers' ratings for effort and ability, were sent for special study to the Bureau of Educational Research of the University of North Carolina.

If, after a year of work with them, each teacher had been able to rank her pupils with perfect accuracy according to their abilities to learn school subjects, the degree of correspondence between the order of her pupils when arranged according to the sizes of their scores on a mental test and the ranking she had made from her subjective estimates of their abilities would be an excellent indication of the worth and validity of the test for classification purposes. Or, if the test scores showed correctly the relative ranking with respect to the academic ability of the pupils tested, then the extent of the teacher's

[1] Because it seemed harder to administer and score than the other tests, three first-grade teachers and one second-grade teacher failed to give Series I of the Dearborn Group Tests of Intelligence.

insight into the mental status of her pupils could be fairly judged by the degree to which the two sets of ratings agreed, the degree of correlation. However, not even the scores of the best of tests can be relied upon absolutely; less reliable are teachers' judgments, the very inadequacy of which has led to the development of standard educational tests.

TABLE I

CORRELATIONS OF TEACHERS' ESTIMATES OF PUPILS' MENTAL ABILITY AND PUPILS' EFFORT IN SCHOOL WORK WITH AGE, AMOUNT OF SCHOOLING, AND SCORES ON EACH OF FOUR PRIMARY MENTAL TESTS*

	Number of Pupils	Age	Amount of Schooling	Cole-Vincent Test	Dearborn Test	Detroit Test	Pintner-Cunningham Test	Effort
Grade I:								
Class 1	41	−.431	−.181	−.064	.....	.298	.341	.435
		−.082	−.200	.054	.....	.319	.257	.....
Class 2	40	−.218	−.317	.299	.340	.353	.309	.741
		−.064	−.062	.122	.215	.293	.156	.....
Class 3	32	−.390	−.350	.182	.334	.108	−.068	.808
		−.202	−.391	.218	.302	.303	.136	.....
Class 4	35	−.414	−.322	.191	.....	.003	.254	−.081
		−.003	−.140	.229	.....	−.064	−.022	.....
Class 5	26	−.137	.248	.563	.226	.505	.419	.670
		−.113	−.178	.358	−.025	.210	.134	.....
Class 6	36	−.240	.486	.512	.535	.465	.508	.800
		−.147	.284	.546	.463	.452	.421	.....
Class 7	31	−.320	−.262	.256	.....	.132	.258	.352
		.230	.....	.466	.....	.438	.374	.....
Class 8	32	.195	.....	.744	.671	.793	.801	.602
		−.168	.....	.492	.515	.465	.523	.....
Grade II:								
Class 9	36	.194	.....	.457	.500	.280	.372	.710
		.102	.....	.386	.430	.266	.398	.....
Class 10	36	−.451	−.229	.436	.....	.465	.599	.184
		.132	−.141	−.056	.....	.152	.096	.....
Class 11	34	.039	−.091	.267	.....	.320	.472	.643
		−.543	−.259	−.290	.....	.172	.265	.....
Class 12	35	.070	.....	.564	.375	.515	.449	.165
		−.020	.....	.132	.179	.383	.119	.....
Opportunity class	18	−.174	−.145	.333	.663	.301	.207	.230
		−.157	.202	−.228	−.102	−.058	−.159	.....

* In the last seven columns the first figure in each case shows correlation with mental ability; the second figure, correlation with effort.

Perfect correspondence between rank based on the teacher's judgments and rank based on test scores would be indicated by a coefficient of 1.00; no relation between the order in one case and that

in the other, by an index of 0.00; and exactly the reverse order in one case from that in the other, by a coefficient of −1.00. Table I shows the degree of correspondence in each of the different classes. The Pearson formula was used.

The correlation of the teacher's estimate of abilities with the Pintner-Cunningham test scores in each of four of the eight first grades is the highest in that grade, but in three of these four cases the Dearborn test was not used on account of its supposed difficulty

TABLE II

RANGE OF CORRELATIONS WITH TEACHERS' ESTIMATES OF ABILITY

TEST	HIGHEST CORRELATION	LOWEST CORRELATION	RANGE
	First Grade		
Cole-Vincent	.744	−.064	.808
Dearborn	.671	.226	.445
Detroit	.793	.003	.790
Pintner-Cunningham	.801	−.068	.869
	Second Grade		
Cole-Vincent	.564	.267	.297
Dearborn	.663	.375	.288
Detroit	.515	.280	.235
Pintner-Cunningham	.599	.207	.392

in administration and scoring. In the five first grades where the Dearborn test was used, the Dearborn test holds first place twice, and each of the other three tests holds first place but once. In the second grades, the Cole-Vincent test holds first place once; the Dearborn test, twice; and the Pintner-Cunningham test twice, in both of which cases, however, the Dearborn test, was not used.

The wide range in correlation indicates either the complete failure of the tests specified to disclose academic ability or the inability of a few teachers, even after a year's acquaintance with them, to estimate accurately their pupils' mental capacity. The latter conclusion seems by far the more probable. It is more reasonable to assume that the teacher of Class 3 knew her pupils' mental abilities less well than the teacher of Class 8 knew the abilities of her pupils

than to assume that the tests used have no prognostic value in some classrooms and great value in others.

It is noted from Table II, which shows the range among the grades, that the most constant correlations in the first grades are those with the Dearborn test scores and in the second grades those with the Detroit test scores.

The mean correlations (Table III) seem to indicate that none of the tests used is as good for the first grade as for the second grade or

TABLE III

MEAN CORRELATIONS OF TEACHERS' ESTIMATES OF PUPILS' ABILITIES AND EFFORT WITH AGE, AMOUNT OF SCHOOLING, AND SCORES ON EACH OF FOUR PRIMARY GROUP INTELLIGENCE TESTS

	ABILITY	EFFORT
	First Grade	
Age	−.244	−.068
Amount of schooling	−.099	−.114
Cole-Vincent test	.335	.310
Dearborn test	.421	.294
Detroit test	.332	.302
Pintner-Cunningham test	.352	.247
Effort	.541	.....
	Second Grade	
Age	−.064	−.067
Amount of schooling	−.155	−.066
Cole-Vincent test	.411	−.011
Dearborn test	.513	.169
Detroit test	.376	.183
Pintner-Cunningham test	.420	.144
Effort	.386	.....

else that the first-grade teachers judge the abilities of their pupils less accurately than the second-grade teachers judge the abilities of their pupils. In the first grade there are very slight differences between the correlations, but the largest difference is in favor of the Dearborn test, which has first place. The mean correlations in the second grade are higher, the mean correlation with the Dearborn test scores again being the highest.

The correlation coefficients of test scores, shown in Table IV, range from .757, between scores on the Cole-Vincent and the Detroit

tests in the first grade, to .473, between scores on the Cole-Vincent and the Detroit tests in the second grade. Since neither of the tests can be taken as the standard of excellence, the high correlation between scores on the Cole-Vincent and the Detroit tests in the first grade does not mean necessarily that either one is the best for use in that grade but merely that the two tests seem to measure in that grade the same characteristics.

TABLE IV

INTERCORRELATIONS OF MENTAL TEST SCORES IN EIGHT FIRST GRADES AND FIVE SECOND GRADES

TEST	COLE-VINCENT TEST	DEARBORN TEST	DETROIT TEST
	First Grade		
Cole-Vincent			
Dearborn	.740*		
Detroit	.757†	.705‡	
Pintner-Cunningham	.745†	.727‡	.752§
	Second Grade		
Cole-Vincent			
Dearborn	.557‖		
Detroit	.473¶	.576‖	
Pintner-Cunningham	.510¶	.695‖	.627¶

* 160 cases.
† 165 cases.
‡ 161 cases.
§ 168 cases.
‖ 92 cases.
¶ 162 cases.

The fact that the intercorrelations of test scores from the first grades are uniformly and considerably higher than the intercorrelations among the second-grade test scores might suggest that the tests studied are better for the first grade than for the second grade. The correlations with the teachers' judgments favor the opposite conclusion. It is reasonable to assume that the second grades present a more homogeneous teaching group, or a group of pupils more nearly alike with respect to ability to learn school subjects, than the first grades. Hence, the higher intercorrelations of test scores obtained in the first grades may indicate that the tests used are excellent for gross classification but that when finer distinctions are to be made these instruments are less adequate.

SIZE OF CLASS AND READING EFFICIENCY

LAWRENCE A. AVERILL AND ALFRED D. MUELLER
State Normal School, Worcester, Massachusetts

What size class can be taught most efficiently? This is a question which superintendents and school administrators generally would like to have answered. Many, perhaps, have already answered it to their own satisfaction by selecting some arbitrary number, based, in all probability, on the size of the standard classroom, and have set the class limit somewhere between twenty-five and forty-five pupils per teacher. When the best-sized class is once decided upon, everything else in the administrative program is made to revolve around the decision.

Recently there has been some speculation as to what actually is the best size of class for obtaining the maximum efficiency of instruction. The North Central Association of Colleges and Secondary Schools, after carefully studying the question statistically and experimentally, arrived at the conclusion that there is no necessary connection between the size of the class and the efficiency of the instruction as measured by the pupils' marks and that the size of the class in itself is not a paramount factor in determining the equity of the teaching load, especially in the classes that do not entail a large amount of clerical work.[1] The same general conclusions were reached in a study made in the School of Education of the University of Michigan.[2]

In both of these studies both instructors and students seemed to favor the small class, although the instructors' objections to large classes would subside in some degree if clerical assistance were provided.

It can seriously be questioned, however, whether the final mark received is a reliable criterion of the efficiency of the instruction.

[1] C. O. Davis, "The Size of Classes and the Teaching Load in the High Schools Accredited by the North Central Association," *School Review*, XXXI (June, 1923), 412–29.

[2] J. B. Edmonson and F. J. Mulder, "Size of Class as a Factor in University Instruction," *Journal of Educational Research*, IX (January, 1924), 1–12.

In his experiments on the relation of the size of the class to the efficiency of teaching, Stevenson[1] found that the average advantage of the smaller classes in the elementary school as a whole is 16 per cent. In Grades V and VII the smaller classes are perceptibly more efficient.

Similar results were found in a study of fifth-grade reading made at the Worcester State Normal School. This study was undertaken in September, 1923, and was carried on by a group of Seniors in the degree course under the direction of the writers. The experiment extended over a period of one semester. The problem was to determine the effect of the size of the class on the efficiency of reading instruction, as judged by some standard reading scale. (The Thorndike-McCall Reading Scale was used.)

The original plan was to have a small class of about twenty-five pupils and a large class of about forty-five pupils, but certain administrative features in the practice school, which is one of the regular city schools, made it impossible to carry out this plan, and it became necessary to reduce the size of both groups. This makes it a study, therefore, of a small class and a medium-sized class.

Care was taken throughout the experiment to control all variable factors except the one being measured. The two groups were selected as nearly as possible on the basis of equal general intelligence, as measured by the Illinois General Intelligence Scale. The general procedure was to place two pupils of approximately equal intelligence scores in the larger group for every one with the same score in the smaller group. The average general intelligence level of both groups was approximately the same.

The two groups were instructed by the same teacher, and the same methods were used for each group. The teacher aimed to have the children read for understanding and appreciation and to gain speed in silent reading. A minimum of oral reading was required. The *Elson Reader*, Book Five, was used as the text, supplemented by other material. Each class recited daily for a period of twenty-five minutes. Class periods were alternated, thus neutralizing any possible advantage one class period might have over the other.

[1] P. R. Stevenson, *Smaller Classes or Larger*. Journal of Educational Research Monographs, No. 4. Bloomington, Illinois: Public School Publishing Co., 1923.

The first standard reading test was given about three weeks after the opening of school in order to allow enough time for the pupils to adjust themselves to school conditions and to overcome the "stagnation" due to the summer vacation. A second form of the same test was given at the close of the experiment. The results and conclusions are based entirely on the records of the initial and the final tests.

Tables I and II present the tabulation of the results of all data secured from the larger and smaller groups, respectively. Column 2 shows the chronological age in months of each pupil. Columns 3 and 4 show the mental age and the I.Q., respectively, the Illinois General Intelligence Scale being employed for obtaining these data. Column 5 shows the September reading scores obtained from the Thorndike-McCall Reading Scale, Form 1, arranged in descending order. Column 6 represents the interpretation of the data of Column 5 in terms of reading age, as provided in the Thorndike-McCall evaluation tables. Column 7 shows the reading quotient, that is, the result obtained by dividing the reading age by the chronological age. Column 8 shows the achievement quotient, that is, the result obtained by dividing the reading age by the mental age, thus bringing the mental abilities of the pupils into relationship with their reading achievements. Columns 9 and 10 show the reading age and the mental age which should obtain at mid-year, computed on the basis of the pupil's status in September, provided he makes the progress in five months warranted by his September achievement. Column 11 shows the January prediction objective of each pupil, as read from the Thorndike-McCall tables. Column 12 indicates the reading score actually achieved by each child in January, as shown by Form 2 of the Thorndike-McCall scale. Column 13 shows the relation between the January prediction and the January achievement. Column 14 shows the reading age derivatives, as read from the tables; Column 15, the January reading quotient, computed in the same manner as the reading quotient in Column 7 but using the January scores as the basis for computation; and Column 16, the January achievement quotient. Column 17 shows the final relation between the September and the January achievement quotients.

Figure 1 presents in graphic form the data given in the last

TABLE I

DATA FOR LARGER CLASS

Pupil	September, 1923									January, 1924				
	Chronological Age	Mental Age	I.Q.	Reading Score	Reading Age	Reading Quotient	Achievement Quotient	Estimated January Reading Age	Estimated January Mental Age	January Reading Objective	Reading Score	Difference between Prediction and Achievement	Reading Age	Reading Quotient	Achievement Quotient	Difference between September and January Achievement
1	139	159	115	60	178	128	112	183	164	62	55	−7	164	114	100	−12
2	128	134	105	58	172	134	128	176	138	59	61	+2	181	136	131	+3
3	126	139	110	56	167	133	120	171	143	58	57	−1	169	129	118	−2
4	125	138	104	56	167	134	121	171	142	58	57	−1	166	123	112	−9
5	131	116	89	53	158	121	136	162	120	54	57	+3	169	124	141	+5
6	125	138	110	53	158	126	114	162	142	54	53	−1	158	122	111	−3
7	124	134	108	51	152	123	113	157	138	53	51	−2	152	118	110	−3
8	129	128	99	49	147	114	115	151	132	51	49	−2	147	110	111	−4
9	122	141	116	47	141	116	100	147	146	49	47	−2	141	111	96	−4
10	133	143	107	47	141	106	99	145	147	48	47	−1	141	102	95	−4
11	132	130	98	47	141	107	108	145	133	48	47	−1	141	103	105	−3
12	138	113	82	47	141	102	125	144	116	48	51	+3	152	106	130	+5
13	129	92	71	45	135	105	147	138	95	46	47	+1	141	105	148	+1
14	141	145	103	43	130	92	90	134	149	45	43	−2	130	89	87	−3
15	175	115	65	43	130	74	113	133	118	44	43	−1	130	72	110	−3
16	139	120	86	42	127	91	106	130	123	43	45	+2	135	94	109	+3
17	148	131	89	42	127	86	97	131	134	43	45	+2	135	88	100	+3
18	128	111	87	42	127	99	114	130	114	43	43	0	130	98	113	−1
19	138	117	85	40	121	88	103	125	122	41	40	−1	121	85	100	−3
20	155	147	95	39	118	76	80	122	151	40	45	+5	135	84	89	+9
21	132	125	95	39	118	89	94	121	128	40	41	+1	124	91	96	+2
22	143	135	95	39	118	83	87	122	139	40	45	+5	135	91	97	+10
23	134	133	99	38	116	87	87	120	136	40	41	+1	124	89	90	+3
24	121	128	106	36	110	91	86	113	131	37	49	+12	147	117	110	+24
25	162	98	60	35	107	66	109	109	100	36	38	+2	116	69	115	+6
26	185	100	54	35	107	58	107	109	102	36	38	+2	116	61	113	+6

TABLE II

DATA FOR SMALLER CLASS

Pupil	September, 1923									January, 1924					
	Chronological Age	Mental Age	I.Q.	Reading Score	Reading Age	Reading Quotient	Achievement Quotient	Estimated January Reading Age	Estimated January Mental Age	January Reading Objective	Reading Score	Difference between Prediction and Achievement	Reading Age	Reading Quotient	Achievement Quotient	Difference between September and January Achievement
1	134	154	115	56	167	125	108	172	159	58	55	−3	164	118	103	−5
2	132	138	105	53	158	120	114	162	142	54	51	−3	152	111	106	−8
3	141	130	92	47	141	100	108	145	134	48	41	−7	124	85	92	−16
4	154	102	66	45	135	88	132	138	105	46	51	+5	152	96	144	+12
5	141	120	86	43	130	92	108	133	124	44	43	−1	130	89	105	−3
6	119	119	100	43	130	109	109	134	123	45	55	+10	164	131	132	+23
7	132	143	109	43	130	98	91	134	147	45	51	+6	152	111	102	+11
8	117	137	117	43	130	111	95	135	142	45	51	+6	152	125	106	+11
9	130	129	99	42	127	98	98	131	133	43	47	+4	141	104	106	+8
10	147	109	73	40	121	82	111	124	112	41	40	−1	121	80	107	−4
11	121	118	97	38	116	96	98	119	121	40	45	+5	135	107	110	+12
12	151	124	82	38	116	77	94	119	127	40	49	+9	147	94	115	+21

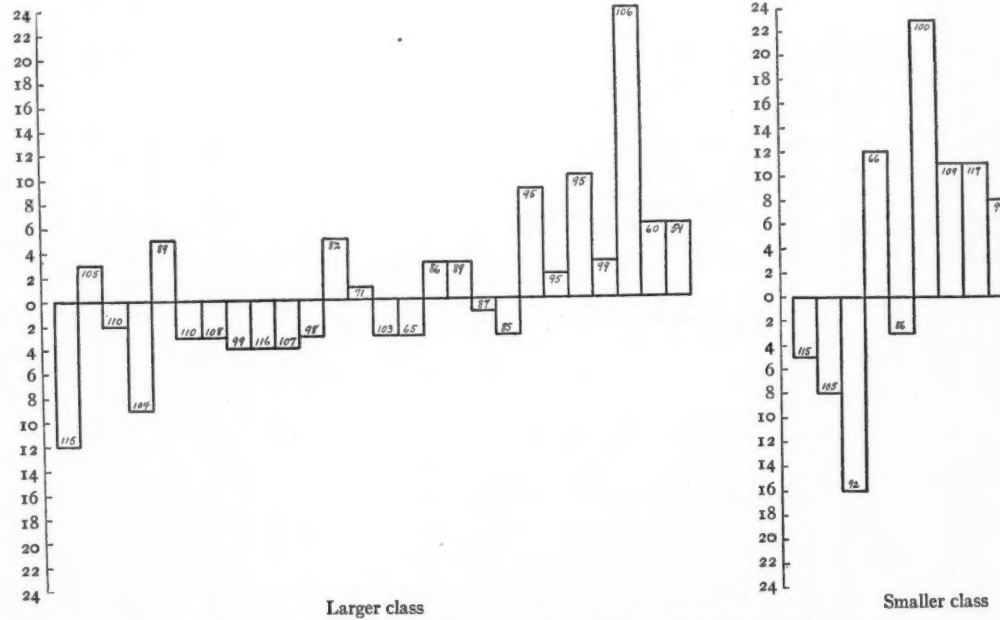


FIG. 1.—Plus and minus difference between September and January achievement

columns of Tables I and II. The base line represents the January A.Q. objective for each pupil, and the rectangles indicate the plus or minus achievement of the objective, those below the base line indicating the pupils who failed to maintain their A.Q.'s and those above the base line indicating the pupils who succeeded in maintain-

TABLE III

DISPLACEMENT OF PUPILS IN LARGER GROUP IN T-SCORE*

I.Q.	September T-Score	January T-Score	Displacement	Difference between Prediction and Achievement
116	10.5	12.5	−2.0	−2
115	1.0	5.0	−4.0	−7
110	3.5	3.0	+0.5	−1
110	5.5	6.0	−0.5	−1
108	7.0	7.5	−0.5	−2
107	10.5	12.5	−2.0	−1
106	24.0	9.5	+14.5	+12
105	2.0	1.0	+1.0	+2
104	3.5	3.0	+0.5	−1
103	14.5	20.0	−5.5	−2
99	23.0	22.5	+0.5	+1
99	8.0	9.5	−1.5	−2
98	10.5	12.5	−2.0	−1
95	21.0	16.5	+4.5	+5
95	21.0	22.5	−1.5	+1
95	21.0	16.5	+4.5	+5
89	5.5	3.0	+2.5	+3
89	17.0	16.5	+0.5	+2
87	17.0	20.0	−3.0	0
86	17.0	16.5	+0.5	+2
85	19.0	24.0	−5.0	−1
82	10.5	7.5	+3.0	+3
71	13.0	12.5	+0.5	+1
65	14.5	20.0	−5.5	−1
60	25.5	25.5	0.0	+2
54	25.5	25.5	0.0	+2

* This table is to be read as follows: The pupil who ranked highest in I.Q. ranked 10.5 in the September T-score and 12.5 in the January T-score, thereby losing 2 places. This child also failed in reaching his objective (−2).

ing their A.Q.'s and actually increased them during the half-year. The depth of the rectangle shows the relative degree of failure or success of the pupil. The number in each is the I.Q. of the pupil concerned.

Tables III and IV show the amount of displacement between the September and January T-scores. The records of the pupils are arranged according to the descending order of the I.Q.'s. Those

pupils who stood at a lower point in the T-score list in September than in January are entered as plus (+); those who stood at a higher point in the September list are entered as minus (−). Column 5 indicates the number of units by which each pupil fell below or surpassed his T-score objective in January. Thus, in the larger

TABLE IV

DISPLACEMENT OF PUPILS IN SMALLER GROUP IN T-SCORE*

I.Q.	September T-Score	January T-Score	Displacement	Difference between Prediction and Achievement
117	6.5	4.5	+2.0	+6
115	1.0	1.5	−0.5	−3
109	6.5	4.5	+2.0	+6
105	2.0	4.5	−2.5	−3
100	6.5	1.5	+5.0	+10
99	9.0	8.0	+1.0	+4
97	11.5	9.0	+2.5	+5
92	3.0	11.0	−8.0	−7
86	6.5	10.0	−3.5	−1
82	11.5	7.0	+4.5	+9
73	10.0	12.0	−2.0	−1
66	4.0	4.5	−0.5	+5

* This table is to be read as follows: The pupil who ranked highest in I.Q. ranked 6.5 in the September T-score and 4.5 in the January T-score, thereby gaining 2 places. This child also succeeded in surpassing his objective by 6 points.

group, the pupil with the highest I.Q. lost two places on the list and failed to reach his objective by two points.

CONCLUSIONS

The following conclusions from the study appear obvious:

1. A considerable percentage of the pupils in both classes failed in January to maintain their A.Q. promise. Fifty per cent of the pupils in the larger class and 42 per cent of the pupils in the smaller class fell below the point predicted for them on the basis of their September achievement.

2. Figure 1 indicates that, while substantial gains in A.Q. were made by the majority of the pupils in both the larger class and the smaller class, the average gain was very much greater in the smaller class. Those in the larger class who gained in A.Q. made an average gain of 6.2 points, while those in the smaller class who gained in A.Q. gained 14.0 points, the average gain made by the latter group being

somewhat more than 100 per cent greater than the average gain made by the former group.

3. It is a significant revelation of the study that in both classes the majority of those pupils who failed to achieve their A.Q. prediction had I.Q.'s ranging from 92 to 110 and could be classified, therefore, as of average intelligence. In the larger class, of those thus failing, 76.9 per cent had I.Q.'s of 98 or higher, while only 23.1 per cent had I.Q.'s below 98. In the smaller class, 60 per cent of those failing to achieve their A.Q. prediction had I.Q.'s of 92 or higher, while 40 per cent had I.Q.'s below 86. Equally significant is the fact that the majority of those in the larger class who exceeded their A.Q. prediction had I.Q.'s below 90 (54–89), while 28.6 per cent of those corresponding in the smaller class had I.Q.'s below 90 (66–82). In other words, in both classes, notably in the larger class, failure to meet A.Q. prediction was found to be associated with high I.Q.

4. It is significant that in the larger class the greatest gains in A.Q. were made by those pupils whose I.Q.'s were the lowest. The explanation appears to be that the teacher devoted disproportionate energy and attention to urging the duller, slower pupils forward, while those naturally brighter and keener were permitted to progress not only at a much slower rate than they were capable of maintaining but at a rate relatively much slower than that maintained by the more meagerly endowed children. This is in accord with the practice of most teachers of permitting the most capable pupils to lag while those who are least capable are urged forward at somewhere near their maximum rate.[1]

5. In both classes there were pupils of superior general intelligence who failed to fulfil their A.Q. promise. Furthermore, there were pupils of inferior general intelligence who not only fulfilled their A.Q. prediction but exceeded it by a substantial amount.

6. The smaller class made greater average gain in A.Q. performance over A.Q. prediction. Of the net algebraic gain in A.Q. made

[1] For a recent study of this actuality, see Andrew H. MacPhail, "The Correlation between the I.Q. and the A.Q.," *School and Society*, XVI (November 18, 1922), 586–88. MacPhail found that increases in the I.Q.'s of 409 Providence public-school children were accompanied by decreases in the A.Q.'s and that, on the whole, "the greater the intelligence of the pupil, the less is he actually accomplishing in school what one is justified in expecting him to accomplish."

by both classes, 61 per cent was made by the smaller class and 39 per cent by the larger class. The difference of 22 per cent is a measure of the greater progress made by the smaller class. In other words, the gain made in reading skill in one-half year by a class of twelve fifth-grade pupils will be 22 per cent greater than the gain made in reading skill by a class of twenty-six children of equivalent initial intelligence. If equal residual gains are made throughout the entire elementary-school period beyond the middle of the fourth grade, the pupils will possess at the time of high-school entrance almost exactly twice as great reading ability.

7. Finally, mention should be made of the practical value which this type of study of the classroom product has for the progressive teacher. Data similar to those presented in Figure 1 show clearly the intelligence, achievement, and success or failure of each pupil in the class. The teacher perceives at once which pupils are working at a low level, which ones are working at a high level, and what adjustment she herself needs to make in order to insure to every child the progress that his ability warrants.

MARRIAGE AS A LEGAL CAUSE FOR DISMISSAL OF WOMEN TEACHERS

I. N. EDWARDS
University of Chicago

Many women now wish to continue their work as teachers after marriage. The question not infrequently arises, therefore, as to what effect marriage has on their contractual relations. There are a number of aspects of the general problem which have come into the courts for adjudication.

First of all, Can a board of education discharge a teacher who marries at some time during the school year for which she has been employed? Where there is no specific statutory authority and where the right has not been reserved in the contract, the courts of final jurisdiction have uniformly answered the question in the negative. The fundamental reason for so holding is that marriage in and of itself does not necessarily disqualify a woman for teaching. Any rule, therefore, which makes marriage a cause for dismissal is regarded as arbitrary and unreasonable. The strongest statement of this point of view is found in an opinion of the Supreme Court of Oregon.

> We prefer to proceed with the inquiry and determine whether the single fact of marriage can, in advance and alone, be said to be a reasonable cause for dismissal. . . . . Efficiency and competency of teachers and the welfare of the schools are, of course, consummations "devoutly to be wished." If a teacher becomes inefficient or fails to perform a duty, or does some act which of itself impairs usefulness, then a good or reasonable cause for dismissal would exist. The act of marriage, however, does not, of itself, furnish a reasonable cause. That the marriage status does not necessarily impair the competency of all women teachers is conceded by the school authorities when they employ married women, as they are even now doing, to teach in the schools of this district. . . . . The reason advanced for the rule adopted by the board is that after marriage a woman may devote her time and attention to her home rather than to her school work. It would be just as reasonable to adopt a rule that if a woman teacher joined a church it would work an automatic dismissal from the schools on an imagined assumption that the church might engross her time, thought, and attention to the detriment of the schools.[1]

[1] *Richards* v. *District School Board*, 78 Ore. 621, 153 Pac. 482, Ann. Cas. 1917D 266, L.R.A. 1916C 789.

There are two other significant cases involving marriage as a statutory ground for dismissal. In West Virginia the law provided that teachers could be removed for "incompetency, neglect of duty, intemperance, profanity, cruelty, or immorality." The supreme court of that state held that marriage was not covered by any of these items and did not, therefore, constitute a ground for removal.[1] Similarly, the Greater New York charter provided that teachers could be discharged for "gross misconduct, insubordination, neglect of duty, or general inefficiency." The board of education attempted to enforce the following by-law: "Should a female principal, head of department, or teacher marry, her place shall thereupon become vacant." The Court of Appeals did not find it necessary to pass upon the reasonableness of the by-law but held that the board of education had no authority to make it under the terms of the charter.[2] Both the foregoing opinions are based on a fundamental principle of statutory interpretation. Where the legislature enumerates certain causes for the dismissal of teachers, the courts regard such enumeration as exhaustive. The theory is that the law-making power expressed its full intent.

A somewhat more complicated situation arises where a teacher promises in her contract not to marry during the term of her employment but later violates her agreement. In an Indiana case[3] a teacher, in applying for a position, told the township trustee that she was not married and did not expect to marry during the school year. Somewhat later she entered into a contract to teach, signing it with her maiden name in spite of the fact that she had been married for four days. When the trustee learned her real status, he discharged her, and she sued for her salary. The court ruled that the contract was void because it was secured through fraud and misrepresentation. Further, it was held that where a teacher promises in her contract not to marry, such a promise becomes a valid part of the contract and, when violated, constitutes a legal cause for dismissal.

There is no other case exactly in point, but it seems that the court was in error in holding that a promise not to marry is legally

[1] *Jameson* v. *Board of Education*, 74 W.Va. 389, 81 S.E. 1126.

[2] *People ex rel. Murphy* v. *Maxwell*, 177 N.Y. 494, 69 N.E. 1092.

[3] *Guilford School Township* v. *Roberts*, 28 Ind. App. 355, 62 N.E. 711.

binding upon a teacher. The great weight of authority is to the effect that contracts in general restraint of marriage are void because they are contrary to public policy.[1] In one case it was said:

> Courts refuse to enforce or recognize certain classes of acts because against public policy on the ground that they have a mischievous tendency, and are thus injurious to the interests of the state, apart from illegality or immorality. A contract in restraint of marriage is of this nature.[2]

Where, however, the restraint upon marriage is a mere incident to the main object and purpose of the contract, the courts as a rule hold that the contract is not void in all of its terms but only with respect to the promise not to marry.[3] It would seem, therefore, that a provision in a teacher's contract restricting her right of marriage is void and without effect.

An interesting case came before the Court of Appeals of New York testing the authority of a board of education to dismiss a married teacher who absented herself from school for approximately three months for the purpose of giving birth to a child. The court rendered the following decision:

> The legislature could have provided that the relator might be dismissed for no cause whatever. She had no vested right in the position of teacher. Section 1093 of the city charter has made neglect of duty ground for dismissal without any qualifying words. Absence on account of illness or for any other reason, high or low, leaves the duties of the position unperformed and, therefore, neglected by the absentee. The statute has lodged with the board of education the power of deciding cases that thus fall within Section 1093, and the board is required to pass upon the excuses offered in any case of absence. In the proceedings under review the board of education discharged its duties fairly, and the courts cannot by mandamus reverse the conclusions reached.[4]

Chief Justice Bartlett, however, wrote a strong dissenting opinion which was concurred in by Justice Hogan. They held that absences due to childbirth are a logical consequence of employing

[1] *White* v. *Equitable Nuptial Benefit Union*, 76 Ala. 251, 52 Am. Rep. 325; *Chalfant* v. *Payton*, 91 Ind. 202, 46 Am. Rep. 586; *Lowe* v. *Doremus*, 84 N.J. Law 658, 49 L.R.A. (N.S.) 632; *King* v. *King*, 63 Ohio St. 363, 59 N.E. 111, 52 L.R.A. 157; 6 R.C.L. 678.

[2] *King* v. *King*, 63 Ohio St. 363, 59 N.E. 111, 52 L.R.A. 157.

[3] *Fletcher* v. *Osborn*, 282 Ill. 142, 118 N.E. 446, L.R.A. 1918C 311; *King* v. *King*, 63 Ohio St. 363, 52 L.R.A. 157; *Crowder-Jones* v. *Sullivan*, 9 Ont. L.R. 27. For contrary opinion see *Lowe* v. *Doremus*, 84 N.J. Law 658, 87 Atl. 459.

[4] *People ex rel. Peixotto* v. *Board of Education*, 212 N.Y. 463.

potential mothers and that since the state had adopted a policy of employing married women, it must have contemplated such absences. Viewing the matter in this light, they were of the opinion that the teacher in question had not been guilty of neglect of duty as contemplated by law. Since no other case in point has come into the courts, one must remain somewhat uncertain as to the law governing situations of this kind.

No court of final jurisdiction, it seems, has yet passed on the constitutionality of a statute specifically stipulating marriage as a cause for the dismissal of women teachers. In a number of cases, however, laws have been upheld which authorized boards of education to dismiss teachers at pleasure.[1]

It may be said, then, that dismissal of teachers because of marriage is regarded by the courts as unreasonable. Where the statutes specifically enumerate certain causes for dismissal, boards of education are not permitted to dismiss for other causes. Should a teacher misrepresent her marriage status, her contract would be void because it was fraudulently obtained. Where a teacher promises in her contract not to marry, that provision in the contract is without effect because it is contrary to public policy. Absence from school on the part of a married teacher for the purpose of giving birth to a child constitutes a neglect of duty for which she may be dismissed. The law contemplates that every teacher, married or single, be given the opportunity to fulfil the obligations of her contract. So long as such obligations are met, the law is satisfied; when they are not met, the teacher may be removed.

[1] *People* v. *New York Board of Education*, 23 N.Y.S. 473; *Jones* v. *Nebraska City*, 1 Neb. 176; *Gillan* v. *Board of Regents*, 88 Wis. 1042, 24 L.R.A. 336.

SUPERVISION THROUGH SIMPLIFIED TESTING

CHARLES E. NEVILLE
General Philip Kearny Public School, Philadelphia

The modern city school is likely to be a very much overgrown institution. In the larger cities schools of from fifty to seventy-five classes are not at all uncommon. The principal of a school of such size finds it exceedingly difficult to perform his most important duty, namely, supervising the work of the teachers. The tendency to assign more and more administrative duties to the principal has so reduced the time available for supervision as to cause grave concern to educators.

During recent years much attention has been given to the distribution of the principal's time in an effort to provide for classroom supervision. At the best, however, the principal of a very large school can spend but a few minutes at a time in any one classroom. This short observation enables him to secure a general impression of the work and a fairly good idea of the teacher's technique and ability as a classroom manager but little or no knowledge of the results achieved or of the success of the methods employed. If the principal is to make intelligent suggestions to the teachers for the improvement of their methods of teaching, he needs to be thoroughly acquainted with their work.

In an effort to overcome this difficulty, standard achievement and diagnostic tests have been devised. These tests, however, are rather complex and require considerable experience for successful use. As most teachers do not have the necessary experience, the principal usually finds that he must give the tests, which require more time than is always available. Another difficulty in the use of any standard test as a basis of diagnosis and correction of classroom difficulties is that all courses of study are not adjusted to standards; consequently, various conditions must be considered in interpreting the results.

A much simpler method of testing has been used with excellent results in the General Philip Kearny Public School, of Philadelphia.

The teachers in the grades to be examined give, simultaneously, a simple test covering the work in a given subject. Each teacher is provided with a score sheet, on which she is asked to record certain facts with regard to the results of the test in her class. The principal analyzes the score sheets and presents to the teachers concerned his conclusions and any suggestions that he may have regarding methods or the need for emphasis on certain parts of the work.

On October 28, 1924, each teacher of Grades VI B, VII B, and VIII B was given two sheets. The first read as follows:

During today's arithmetic period please give your class the following problems. Mark the work right or wrong, tabulate the results on the accompanying score sheet, and return the score sheet to the office on November 3.

1. Multiply $\frac{3}{5}$ by $\frac{5}{6}$.
2. Multiply .6 by .15.
3. 12 is what percentage of 16?
4. From $\frac{1}{2}$ subtract $\frac{1}{6}$.
5. Add $\frac{3}{5}$ and $\frac{5}{6}$.
6. Add .6 and .15.
7. Find 15 per cent of 14.
8. Divide $\frac{5}{6}$ by $\frac{3}{4}$.
9. From .6 subtract .15.
10. Divide .6 by .15.

The teachers were asked to list the names of the pupils on the score sheet in the order of the number of problems right, with the best score first. The problems were numbered from 1 to 10 across the top of the sheet, and the teachers were asked to make a check mark on the score sheet for each problem that each pupil had right. The total number of problems right was recorded in the last column.

When the score sheets were returned to the office, the principal studied them, analyzed the results, and prepared the following summary, which was presented to the teachers concerned at a group meeting held a few days after the returns were made. At this meeting, there was a thorough discussion of the whole problem.

GRADE VIII B

Percentage right: 75.9.
Median right: 8.

Problems giving most trouble: Nos. 2 and 7.
Principles involved:
No. 2. Cipher to right of decimal quantity.
No. 7. First step in percentage.

GRADE VII B

Percentage right: 69.4.
Median right: 7.
Problems giving most trouble: Nos. 2, 5, and 7.
Principles involved:
No. 2. Cipher to right of decimal quantity.
No. 5. Addition of fractions—L. C. D.
No. 7. First step in percentage.
Class 23 had difficulty with No. 3 (12 is what percentage of 16?)

GRADE VI B

Percentage right: 57.6.
Median right: 6.
Problems giving most trouble: Nos. 2, 7, and 10.
Principles involved:
No. 2. Cipher to right of decimal quantity.
No. 7. First step in percentage.
No. 10. Division of decimals.
Class VI B-2 had trouble with No. 8 (division of fractions). Class VI B-4 had trouble with No. 6 (addition of decimals).

Several weeks after the arithmetic test, a test was given in written English in Grades V B to VIII B, inclusive. Each teacher of written English in these grades received the following instructions:

Please have the class write a brief paragraph on a topic concerning Thanksgiving Day. Mark carefully for following characteristics:
1. Sentence structure
2. Capitalization
3. Punctuation
4. Unity
5. Coherence (Grades VII and VIII only)
Record the number of errors in each point on the accompanying score sheet and return score sheet to the office on Thursday, December 11.

The score sheet called for information with regard to the number of pupils taking the test and the number and percentage of pupils making errors in each of the five characteristics. The principal made an analysis of the results and at a meeting of the teachers presented the data shown in Table I and the following suggestions.

The figures show three outstanding facts: (1) There is a lamentable weakness throughout in sentence structure. (2) The VI A pupils are very weak in all points. (3) Points 4 and 5, the newest to the pupils, are the best known.

The VIII B classes need some extra emphasis on sentence structure. All of the other classes need to stress capitalization. The VI A grades should be given as much extra time as possible on the whole matter of written English. All of the teachers will find help in planning their work from a careful study of their class percentages and the papers of individual pupils.

Tests in geography and history are planned. In these subjects it will be more difficult to arrange good tests because the results to be tested are much less tangible than those in arithmetic and written English. The teachers asked for tests in these subjects, however, for the other tests helped them greatly in understanding their classes and in planning their work.

TABLE I

RESULTS OF PARAGRAPH TEST GIVEN DECEMBER 8, 1924

GRADE	NUMBER OF PUPILS	PERCENTAGE OF PUPILS WITH ERRORS IN				
		Sentence Structure	Capitalization	Punctuation	Unity	Coherence
VIII B	201	28.8	6.8	11.9	4.4	2.4
VII A to VIII A	603	22.2	31.8	25.3	10.6	10.7
VI B	90	40.0	29.0	17.0	7.0	.....
VI A	92	56.6	72.8	55.4	17.4	.....
V B	122	27.8	51.6	36.0	3.2	.....

The results have been invaluable to the principal, since they have enabled him, with a comparatively small expenditure of time, to secure accurate knowledge of the work being done in the school. With this knowledge as a basis, he has been able to make the discussions in the group meetings of the teachers definite, purposeful, and helpful. The principal has a definite objective in his classroom observations and can see in a few minutes whether his suggestions are being carried out. Of course, these tests are not final. The plan is to give similar tests later in the term involving exactly the same principles but using a different content. From the results of these tests, we shall be able to tell whether the weaknesses have been improved and whether the strong points have been retained.

While this plan was devised primarily for use by the principal of a large school, there is no reason why it should not be of value to a superintendent, who, by substituting schools for classes and classes for pupils, could use the analysis of the results as a basis for helpful discussions with his principals.

VISUAL AIDS IN GEOGRAPHY: AN EXPERIMENT

CHARLES EDWARD SKINNER
Miami University, Oxford, Ohio
STEPHEN GOTTHEIL RICH
Essex Fells, New Jersey

The present article is a condensed account of an experiment in Grade VII A geography instruction which was conducted in 1923 in two public schools in New York City—Public School 10 and Public School 171, Manhattan—and which the writers plan to report in full technical detail at a later time. The results, however, are of sufficient general interest and usefulness to the teaching profession that a non-technical paper is, in the writers' opinion, desirable at the present time.

The experiment was conducted through the courtesy and with the co-operation of the central school authorities; E. L. Crandall, director of visual instruction in the New York City schools; the principals of the schools; and the teachers of the classes. The outstanding features of the experiment were the care taken to remove factors that might affect the significance of the results, the use of several means to determine the effects of visual instruction, and the nature of the findings. Particular care was taken to have the methods of instruction constant for all groups; to have in the various groups, so far as possible, pupils of equal ability; and to keep the physical conditions, such as comfort, warmth, and ventilation of classroom, constant for the various groups. In Public School 171 the organization of the school is that of a junior high school; all the groups studied had the same teacher and used the same text. In Public School 10, teachers were chosen whose work was considered by those in authority as being of equal merit; the groups used different textbooks.

Both of the schools are for boys only; both schools are located in densely populated portions of Harlem; the pupils of both schools are, for the most part, American-born children of immigrants from Russia, Rumania, Poland, and Austria; the pupils of both schools come from families speaking both English and Yiddish; the pupils of both

schools are overwhelmingly of the orthodox Hebrew religion; members of the families of the pupils in both schools are employed as skilled and semi-skilled workers in the needle trades. There were no pupils outside the normal range of ages for Grade VII in the classes studied.

The experimental procedure was as follows: During February, when the pupils were studying the geography of the southern states, a total of ten teaching-periods of forty minutes each, with three additional periods of equal length for testing, was used with each group. No home work was given, but most of the pupils studied the subject at home voluntarily. In Public School 171 one class was taught with textbook alone, excluding the use of wall maps; another group was taught by the use of textbook, stereographs, and lantern slides; a third group had all of these aids and moving pictures in addition. All three groups or classes used the text *Geography for the Seventh Grade* by Niver and Farrell; all three groups were taught by Sarah McDermott. The group taught by text alone, which will be called the "text class," met at the first period of the school day; the group taught with stereographs and slides, called the "slide class," met during the second period, just after an arithmetic lesson; the third group, called the "'movie' class," met at the fourth period, just after a lesson in spelling.

At Public School 10 there were only two groups. A text class, using Brigham and Macfarlane's text, was taught by Grace Reynolds, during the third period, just after a lesson in grammar; a slide class, using Redway and Hinman's text, was taught by Herman Reback, during the same period, just after a lesson in word-study.

To determine the results of the work, special tests and questionnaires were used. Four tests in geography were devised, limited strictly to the subject-matter included within the texts on the field covered. Two of these were best-answer tests, of thirty-two questions each, with the questions arranged in the order of increasing difficulty, as determined by previous trial with 150 other pupils of the same grade in schools of the same city. These are called Tests A and B. Two true-false tests, of thirty questions each, similarly arranged and called Tests C and D, were used. The questions in all four tests were chosen from a somewhat larger number of questions,

so that each pair of tests contains an equal number of difficulties; that is, each question in Test A is matched by one in Test B that has been correctly answered by the same percentage of pupils who tried it, and so with Tests C and D. These two forms of test were adopted in order to eliminate all possible errors in judging results due to differences in ability among the pupils in handwriting, English composition, vocabulary, and the like, and to secure as nearly as possible a pure score for information in geography.

The existence of the duplicate forms of test enabled testing to be done at both the beginning and the end of the experiment without any vitiation of results due to familiarity with the questions. Retesting with the same questions was, however, used as a check.

Questionnaires were designed to bring out such phases of the results as could not be conveniently obtained by tests. A questionnaire for the teachers was designed to discover the vitiating factors, if any, and to obtain the teachers' observations of the reactions of the pupils to the different methods of instruction. A questionnaire for the pupils was designed to determine the emotional reactions of the pupils and the spread (or lack of it) of interest in geography due to the various methods of teaching.

The first class period in the case of each of the five groups was given over to testing, using Tests A (best-answer) and D (true-false). The next ten periods were devoted to teaching. Two periods were then used in giving all four tests—A, B, C, and D. The teachers filled in their questionnaires at this point. At Public School 171 further testing was done after an interval of two months, using Tests B and C. The pupils answered the questionnaire at the end of the experiment proper.

Table I shows the results of Test A, which was given at the beginning of the experiment. The results of Test D were practically the same.

The range of scores remains substantially the same for all of the testing as in the initial tests; it is the average gain from one test to another that is significant. Table II shows the average gains for all classes up to the end of the experiment. The results of the tests given in Public School 171 two months after the end of the experiment are shown in Table III.

Exactly the same tendencies are shown by the same test results for groups selected from the various classes of Public School 171 by eliminating enough members to give identical numbers and identical

TABLE I

	Median Score on Test A	Range of Scores on Test A
Public School 171:		
Text class	17	7–25
Slide class	16	9–23
"Movie" class	17	10–26
Public School 10:		
Text class	13	4–24
Slide class	15	6–25

TABLE II

	Best-Answer Tests		True-false Tests	
	Average Gain in Test A over Test A	Average Gain in Test B over Test A	Average Gain in Test D over Test D	Average Gain in Test C over Test D
Public School 171:				
Text class	12.0	8.2	11.8	5.0
Slide class	12.6	5.2	17.1	11.7
"Movie" class	12.6	7.3	16.7	9.7
Public School 10:				
Text class	9.1	7.2	5.6	3.0
Slide class	3.2	4.0	3.0	−1.5

TABLE III

	Average Gain in Test B (Best-Answer Test) over Test B	Average Gain in Test C (True-false Test) over Test C
Public School 171:		
Text class	1.8	0.4
Slide class	2.4	2.8
"Movie" class	3.3	5.0

distribution of the pupils' scores on the Haggerty Intelligence Examination, Delta 2, Form 1. In a few cases the differences are more marked; in a few cases, less marked; but the net results are identical. The same is true of the results for pupils in Public School 10, equating the classes on the basis of the scores in Test A.

It will be noted at once that at the end of the experiment the slide class and the "movie" class at Public School 171 were shown to be substantially equal in attainment; one gained more as shown by the best-answer test, the other more as shown by the true-false test. In three of the four sets of gains recorded, the text class was noticeably below the other two classes. At Public School 10 the text class showed more progress than the slide class. In this school the benefit from visual instruction was offset by some other factor, which we were not able to isolate. Any of the following factors, or a combination of them, is likely to have been effective here: superior teaching ability not recognized by the supervisory officers, the use of a text somewhat more interesting to the pupils, illustrations in the text acting as a means of visual instruction, the influence of the teacher's personality.

The results from the tests given to determine retention show definite benefit from visual instruction, increasing with the amount of visual aids used.

The questionnaire for the teachers shows that the use of visual aids, as observed by the teachers, results in noticeable increase in the interest and responsiveness of pupils, renders discipline somewhat easier, and secures improvement in language (oral expression). The teacher who used motion pictures considers them the most valuable of the visual aids; the teacher of the slide class in Public School 10 considers slides the most valuable of the aids used by him. All agree that the stereographs are the least useful of the visual aids.

The questionnaire for the pupils, which was answered by all of the 121 pupils who took part in the experiment in Public School 171, gives similar data. All the pupils who used visual aids said that they made geography more interesting and easier to learn. Only three of the pupils found that it hurt their eyes to use the stereoscopes; only one admitted any fatigue from the use of the visual aids.

In an effort to find out if visual aids caused any spread of interest, a list of books was given to the pupils at the end of the experiment, including ten on phases of the content studied, five on other geographical subjects (travel books), and ten other books, mostly boys' favorites. The pupils were instructed to "mark the three books you would like to read next." There was no difference notice-

able between the text, slide, and "movie" classes in the choices made by the pupils other than the preference of the text class for *Tennessee Mountaineers* and of the "movie" class for *Story of a Bad Boy*. The consensus of preference was for *The Man without a Country* (possibly because of its being the first on the list), *Tom Sawyer*, and *The Spy*. The little effect of the visual instruction in producing a spread of interest is doubtlesss due to the short time during which the instruction was carried on.

Summing up our results, we find that, so far as the results of this experiment in seventh-grade geography are concerned, the difference in attainment due to the use of visual aids is exceedingly small, if measured to the end of the period of visual instruction. But—and here is the important fact—there was a distinct gain, other factors being equal, in the retention of the information acquired, in interest in geography, and in "pupil morale" in a wide sense. The more varied the forms of visual instruction used, the greater was the gain. Nevertheless, as shown in Public School 10, differences between teachers and differences between texts gave rise to at least as great differences in results as did the presence, variety, or absence of visual instruction.

Certain phases of so short an experiment as this point toward the need for further work to decide some questions. The classes were here working on what was to them a novel and attractive scheme of instruction; the pupils knew that there was a "contest" as to which class would accomplish most. An experiment lasting through at least a full school year is necessary if the effects of novelty and of change from an accustomed method are to be eliminated. Whatever the interpretation of the results—whether in terms of visual aid, in terms of novelty, or in any other terms—the fact stands out that in this case there were found both a genuine gain in long-time results from visual instruction and the existence of counteracting factors sufficient to nullify the immediate gains due to this method. It is the writers' opinion that the gain due to thorough visual instruction, using all the visual aids, is sufficiently great to warrant expenditure of school money on them.

Educational Writings

REVIEWS AND BOOK NOTES

A sociological treatment of the problem of school discipline.—Wherever people are gathered in group living in any of its forms we have "problems" of conduct. The school, as a form of group activity, having within itself the possibility of clashing wills and diverse purposes, is no exception. It gives rise to the special problem of social control known to the teacher as "discipline." It is perhaps not unfair to say that with some teachers discipline is the whole problem of teaching, and in some quarters, even today, the professional worth of a teacher is gauged by his ability to "lick" the big boys and "keep order."

With the rise and spread of more democratic conceptions, however, there has come a questioning of the value of certain types of control. In the schools, no less than in other social institutions, discipline of the autocratic type has felt the onslaughts of democracy. There is a never ceasing demand in a democracy for increasing popular participation. Indeed, democracy is "participation." In the field of education, John Dewey, among the moderns, well states this whole philosophy. On the side of the curriculum, with the problem of acquisition of subject-matter, the project method is one form of answer to the feeling that learning goes on only when there is self-initiated participation. As concerns school conduct, or extra-subject-matter school activity, there has come likewise the feeling that democracy means participation of the group in securing social control.

This conception is foundational to a discussion[1] of the problem of school discipline as seen from the sociological point of view. The author is a university professor of educational sociology, and his treatment of the problem of school discipline might justify the claim of many educational sociologists that psychology alone cannot solve all the problems of educational method. From the beginning to the end of Mr. Smith's discussion is a temperate insistence that conduct, as an outgrowth of social control, is a group, rather than an individual, matter and that the sociological treatment of disciplinary problems is as necessary as psychological treatment. A fair conception of the author's point of view may be

[1] Walter Robinson Smith, *Constructive School Discipline.* Chicago: American Book Co., 1924. Pp. 276. $1.40.

371.5 S663

gained from the statement that "conduct has been analyzed with reference to the nature of the individual child and his responsibility rather than from any possible group causes or social results" (p. 16). His attempt, then, is to make an analysis from the latter point of view.

Permeating this treatment of the problem of school discipline is the idea that "good order," or discipline, is not a means but a real and genuine end in educational effort. "People have taken it for granted that children are kept quiet and orderly in order that arithmetic, geography, and spelling may be taught" (p. 39). Mr. Smith ventures the opinion that life's large purposes may be best expressed in the thought that arithmetic, geography, and spelling are but a means to quiet and orderly social conduct, and his idea of what discipline should be is reflected in his consideration of the too docile pupil as a "disciplinary" case. Good schoolroom conduct and order may be looked upon as a by-product of the activity of a group of people engaged in living together and working at a common task. Since school is a place for learning, then school conduct should be a form of learning—of learning to live together with a minimum of friction, as all social order is a matter of so living together. "School discipline is merely social control within the school group" (p. 41).

The author recognizes and admits a certain weakness that his discussion may have in the opinion of some readers, namely, that of "lack of definite prescription for use in dealing with certain types of offense and standard disciplinary cases" (p. 263). He insists, however, that "teacher-training institutions can no more instruct a teacher how to meet specific situations than a law school can inform a young lawyer how to win a particular case" (p. 263). All that can be done is to set forth large general principles which the student may illuminate by a study of the best practices and specific cases and which in turn may illuminate the specific problems which he may have as a teacher.

It must not be thought, however, that this book treats the problem of school discipline in an impractical, philosophical way. Very practical and applicable discussion is given of various specific problems of classroom discipline, punishment, rewards, student government, and general student participation. Administrators will find an especially helpful treatment of the subject of "School Spirit," with an extreme minimum of the educational sentimentalist's "soft pedagogy." There is included, also, a short history of various forms of student participation and student government as they have been attempted in various institutions of differing grade. Each chapter is summarized; the list of questions following each chapter illuminates the chief issues under discussion; and a series of problems furnishes an inviting point of departure for original thinking.

Teacher-training institutions will find this book an excellent text in its field, and administrators and classroom teachers will discover here a rather helpful and original sociological treatment of one of their oldest and most difficult problems.

EUGENE A. BISHOP

MARYLAND STATE NORMAL SCHOOL

Light on modifications in the teaching of grammar.—Revision of the course of study in grammar on the basis of actual language needs is now an accepted doctrine. This principle is the outgrowth of many investigations, the earliest of which was made by Briggs ("Formal English Grammar as a Discipline," *Teachers College Record*, September, 1913). Other investigators, of whom the leader is W. W. Charters ("Minimal Essentials in Elementary Language and Grammar," Sixteenth Yearbook of the National Society for the Study of Education, Part I), have tabulated the language errors of school children in both oral and written discourse. Courses of study frequently, and textbook-makers occasionally, have organized instruction on the basis of minimal essentials. All these workers in a perplexing and difficult field have been laboring to reform what is commonly admitted to be a useless grind of formal grammar.

The latest publication dealing with grammar[1] is an abbreviated and, to a certain extent, "popularized" version of a much longer and more elaborate publication. The authors, frankly facing the questions, "What should be the content of the course in grammar?" have endeavored to seek an answer, through careful investigation, from two points of view: "What does present-day *usage* advise regarding the content of the grammar course?" "What does present-day *need* advise regarding the content of the grammar course?"

The first question is answered by the analysis of ten thousand sentences selected from ten different sources, ranging from five hundred high-school compositions to five hundred sentences of editorial material from current newspapers. Frequencies in usage were determined for the ten major topics which constitute the main divisions of a complete course in grammar. Moreover, frequencies in usage were arranged in eleven classifications: adult usage, upper-class university usage, college-freshman usage, and the usage of eight other groups, namely, high-school Seniors, Juniors, Sophomores, Freshmen, and pupils of Grades VIII, VII, VI, and V. In the frequency of use of complex sentences, for example, the adult average was 37 per cent; deviations from the adult average for the other ten classifications were, in the order named, +7.1, +4.3, −1.8, −6.4, −6.2, −8.0, −16.6, −12.7, −24.2, −31.3. A few of the major conclusions reached on the basis of data on usage frequencies are typical:

1. The problem of teaching consists largely in giving pupils practice in the use and control of complex sentences.

2. Exclamatory, imperative, and interrogative sentences may be disregarded.

3. Adverbial clauses of "time," "degree," "condition," "cause," and "manner" should receive attention in the grades; clauses of "concession," "place," and "purpose" should receive attention in the high school.

4. There is overemphasis on several topics connected with the infinitive.

5. The time of a language class devoted to the study of nouns should be spent on (*a*) the use of correct forms of the genitive case, (*b*) the proper under-

[1] Martin J. Stormzand and M. V. O'Shea, *How Much English Grammar?* Baltimore: Warwick & York, Inc., 1924. Pp. 224.

372.425 S 885

standing of the "non-possessive" use of the genitive case, (*c*) a freer use of appositives, and (*d*) a freer use of prepositional phrases.

6. Only one case, the genitive, needs attention.

7. Classification of nouns as common or abstract serves no useful purpose.

8. Declension of pronouns is a vital topic in grammar. Classification of pronouns according to use is of little practical value.

9. The subjunctive mood may be neglected.

10. "Shall" and "will," non-future, represent grammatical niceties not worth the time and labor required.

The authors attack the second part of their inquiry, concerning present-day *needs*, by reviewing several of the important studies of language errors, by making a similar study of their own, and by determining correlations between the findings of the various studies. They go one step farther, determining an "error quotient" for each of the errors tabulated by themselves or by others. Obviously, the actual *number* of errors made by children should be considered in relation to the number of *chances* for error. They find that the error "incomplete sentences" has an error quotient of .004, while the "wrong form of possessive nouns" has an error quotient of .427. Upon the latter much school drill is in order; the former may perhaps be neglected. Again, "in school compositions pupils will put the subject or object of a verb in the wrong case once in one thousand chances. . . . . The predicate nominative will be put in the wrong case twice in one hundred chances" (p. 187). The position taken by the authors is that such objective data for *all* common errors must ultimately be considered in a scientifically made course of study.

At the end of the volume, by means of a careful study of ten widely used language texts, the earliest copyrighted in 1877 and the latest in 1918, the authors show that the amount of formal grammar has gradually decreased from 100 per cent in the earlier books to approximately 60 per cent in the later texts, while practice exercises have increased from 17 per cent to 50 per cent. Grateful modifications are revealed, such as a breaking-away from "parsing, classification, analysis, and drill on rules" toward "the type of exercise that compels expression or functional application of grammatical technique."

The book closes with a recapitulation of recommended changes as to the content of instruction in grammar, very significant for students of English curriculums. Among the more important recommendations are the following:

1. The distinction between simple, compound, and complex sentences is fundamental.

2. Three types of clauses—adverbial, substantive, and adjectival—are important in *frequency*, but drill on classification exercises is unwarranted, because the functional distinctions serve no purpose in sentence control.

3. The distinction between restrictive and non-restrictive adjectival clauses should be emphasized.

4. Distinction of adverbial clauses as to meaning, overworked by analytical grammars, may be eliminated.

5. Material dealing with split infinitives, the genitive used with the gerund, and confusion of past tense and past participle should take the place of the useless drill on infinitives, participles, and gerunds.

R. L. LYMAN

School indebtedness.—Of recent years the mounting public indebtedness has become a matter of grave concern. Fear has been felt lest interest and sinking-fund charges shall become so great that sufficient revenues cannot be obtained for running expenses; indeed, this predicament is already faced by many communities.

The same principles that govern expenditures in private finance should control expenditures in public finance. A principle generally accepted in private finance is that one should not go into debt unless absolutely necessary and, when in debt, should arrange to get out as quickly as possible. This principle is as good business policy in public life as in private affairs.

Sound business practice dictates, therefore, that a pay-as-we-go policy should be followed whenever possible. Moreover, altruism should cause each generation to pay its own debts and not saddle them on future generations. These economic and humanitarian principles, principles that date from the time of Adam Smith, have been much violated of recent years. Verily, in piling up our public debt, we have been burning the candle at both ends; a day of reckoning cannot be long postponed.

It is time to call a halt—to get back to a pay-as-we-go basis. Such is the main thesis of a study[1] of the school indebtedness of one state, Illinois. This study is published as Volume XI of the Report of the Educational Finance Inquiry Commission.

In general, the study describes and interprets the trends of bonded indebtedness for schools in Illinois from 1873 to 1922. More specifically, it discusses, among other things, the location of bonded indebtedness, the causes of increased bonded indebtedness, the outlook for future bonding, the floating of bond issues, the cost of bonded indebtedness, floating indebtedness, school indebtedness compared with the indebtedness of other taxing units, and the probability of repayment of the indebtedness.

Some outstanding findings of the study are: bonded indebtedness and floating indebtedness have increased very rapidly, particularly in recent years; indebtedness has increased much more rapidly than the total population and school attendance; some districts have many times as much indebtedness as others; the high schools, particularly the smaller ones, have far more indebtedness per pupil than the elementary schools.

Some of the outstanding merits of the study are: it is timely; it is written with unusual clearness, particularly for an academic document; it is scientific in that it is accurate, objective, impartial, and verifiable.

The study would have been improved by the addition of more data on

[1] George W. Willett, *The Public School Debt in Illinois*. Report of the Educational Finance Inquiry Commission, Vol. XI. New York: Macmillan Co., 1924. Pp. xvi+98.

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trends of indebtedness as compared with trends of real or assessed wealth; some data on the value of school property as compared with school indebtedness, that is, assets compared with liabilities; and a summary.

In the judgment of the reviewer, the study is the best treatise on the public school debt of a single state that has yet appeared. It will be of interest primarily to the people of Illinois, but, because of its generally applicable technique, it will be of value to students of school finance everywhere.

WARD G. REEDER

OHIO STATE UNIVERSITY

Objective tests and examinations.—We have known for more than fifteen years that teachers' marks are extremely variable. The situation is so bad that one child out of every four has a teacher who grades so poorly that a "square deal" is out of the question. Some papers are marked as much as 50 per cent too low or too high. Teachers and supervisors have long known of this state of affairs, but, unfortunately, all that they have done about it has been to find out how poor the grading is. There has been diagnosis without end but very little of a remedial nature. It is with keen interest, therefore, that one at last finds a book[1] which suggests a solution of the grading problem. This solution is based on the well-established fact that variability in grading may be almost, if not entirely, eradicated by stating the questions in certain forms. Professor Ruch gives detailed information concerning the forms to use. He sets forth in a manner entirely sound and clear the functions and criteria of a good examination. He includes a chapter on "Sources of Error in Written Examinations," which shows why the traditional types of questions are intolerable and then tells how to prepare examination questions which will lead to accurate and just judgments of pupil achievement.

In the chapter entitled, "Experimental Studies of Several Types of Objective Examinations," the author gives data showing the relative value of the true-false, multiple-response, and completion types of question. The closing chapter is concerned with "Statistical Considerations Related to Examination Technique."

In an appendix of thirty-five pages the author gives sample questions in approved form suitable for high-school classes. These are exceedingly valuable for practical use.

The book is by no means the final word on the subject, and there are a few statements in it which some readers will be inclined to question, but these criticisms are of minor importance. The main point is that we at last have a definite plan of escape from the accusation that school children are graded unfairly. The book should be read by all who prepare examination and test questions for use in our schools.

W. J. OSBURN

STATE DEPARTMENT OF PUBLIC INSTRUCTION
MADISON, WISCONSIN

[1] G. M. Ruch, *The Improvement of the Written Examination*. Chicago: Scott, Foresman & Co., 1924. Pp. x+194. $1.80.

371.27 R899

Another book on the project method.—Every teacher of methods in a teacher-training institution must, of necessity, deal in some fashion with project-teaching. Some institutions offer a course entitled "The Project Method." Others, and these represent the larger number, include the topic in their general or special methods courses. The author of a recent book[1] has endeavored to show certain well-established principles of teaching as these principles function in the project method.

The material of the book is divided into two parts. Part I, about forty pages in length, contains a brief statement of the fundamental theories underlying methods of teaching; these include the laws of learning, the place of thinking in the learning process, the laws of habit formation, the relation of memory to thinking, etc. Part II is devoted to illustrative material. In the first chapter of this division the author shows, through contrasting examples, the value of organizing subject-matter in relatively large units, "large enough," he says, "to embrace a number of allied and related facts or interests that must be investigated, analyzed, or worked out in order to satisfy the inquiry or need suggested by the unit of subject-matter" (p. 37). This is in marked contrast to the older method, which required the pupil to memorize the facts found in the textbook with little regard for their significance. The tendency to organize subject-matter in terms of larger units is, to quote again, "finding expression today in a type of activity termed *the project*. In this method we are seeking to present desirable subject-matter in a way that will call for the meaning and use of facts and that will at the same time provide situations for the operation of all the principles and laws set forth in Part I" (p. 40).

The remaining chapters are given over to detailed descriptions of projects which have been carried out in different classrooms. Each account includes (1) a statement of the project, (2) the teacher's aims, (3) the materials used, (4) the procedure in detail, and (5) the teacher's estimate of the results. Furthermore, each project is justified in terms of the principles of method which it illustrates. One example is taken from a normal-school class. Contrasting examples of history teaching are given, one from a college class in which the lesson was of the question-and-answer type based on textbook study, the other from a sixth-grade class in which the particular lesson was the outgrowth of project-teaching. Practically every grade is represented through one or more of the examples given in the book.

The author's conception of the relation of the project to the problem is that the project represents the larger unit of activity and that its working out presents many difficulties which are termed problems. Other writers regard the problem as the more inclusive term, maintaining that all projects are problems but that there are many problems which do not involve projects.

On the whole, the material of this volume is well organized and very clearly presented. The examples of projects are, for the most part, excellent. The book

[1] E. A. Hotchkiss, *The Project Method in Classroom Work*. Boston: Ginn & Co., 1924. Pp. xiv+258. $1.48.

371.36 H 832

should prove useful in normal-school and college classes in supplementing the briefer discussions of the project method commonly found in the recent books on general methods.

ALICE TEMPLE

A handbook of supervision.—The problem of the supervision of teachers is one of the outstanding considerations engaging the attention of superintendents and principals in public-school systems today. The task of supervision is a complicated undertaking, and special training is necessary in order to prepare for the work. It was to help superintendents, principals, and others to study the problems of supervision in detail that Mr. Scott prepared his book.[1] The author has clearly expressed this purpose in the first paragraph of the Preface.

> This small volume is designed for principals, supervisors, and superintendents and for use in classes in supervision in teacher-training institutions. It is hoped that it will furnish to those responsible for educational supervision some such help as the author himself so frequently felt the need of in his experience as superintendent of schools and, it might be added, so seldom found.

The introductory chapter presents briefly the development of supervision from school management and the relation of supervision to administration. Chapter ii discusses continuity of the child's education as an aim of supervision. Chapter iii deals with economy in education as an aim of supervision. Chapter iv sets forth in some detail the development of teaching ability as an aim of supervision. The final chapter discusses supervision in operation as guided by the three aims developed in chapters ii, iii, and iv.

The material is very well organized and is of practical value. It covers only a very limited part of the fundamental principles underlying the science of supervision, but it should prove very useful in a study of the particular phases discussed. The book should be especially helpful to superintendents and principals in establishing a program of supervision in proper relation to the work of administration.

H. W. NUTT

OHIO WESLEYAN UNIVERSITY

A study of age differences in mental tests.—The Doctor's thesis[2] prepared by Florence M. Teagarden has for its aim a study of three aspects of mental growth. These are (1) the age at which mental growth ceases, (2) the form of the mental-growth curve, and (3) the distribution of abilities at various ages. The method consisted of giving three group tests and the Stanford Revision of the Binet-Simon Scale to 408 children in Mooseheart, Illinois. The ages of the children ranged from twelve and one-half to twenty, but the number beyond

[1] Charles Edgar Scott, *Educational Supervision.* Milwaukee, Wisconsin: Bruce Publishing Co., 1924. Pp. 98. $1.00.

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[2] Florence M. Teagarden, *A Study of the Upper Limits of the Development of Intelligence.* Teachers College Contributions to Education, No. 156. New York: Teachers College, Columbia University, 1924. Pp. vi+112.

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eighteen years of age was small. The study was made at Mooseheart because it was thought that there was less elimination and selection of cases in this institution than in the public schools. The inferences are drawn from a comparison of the scores made by the children at the various age levels.

The monograph opens with an elaborate review of previous studies which bear on the problems of the investigation. The conditions of the present investigation are then described in much detail. The results of the experiment are presented with great elaboration of statistical technique.

The general conclusions are that mental growth continues up to the age of eighteen at least but that the rate of growth diminishes from twelve to eighteen. The range of the distribution of abilities was found to increase with the higher ages. The monograph has been very carefully prepared, and the study makes a contribution to the solution of the problems with which it deals.

FRANK N. FREEMAN

Books for primary teachers.—The limitations of space, together with the large number of new books in the field of primary education, forbid the extended review of each of these publications. Brief notes covering the essential characteristics of these books should, however, be of service to primary teachers and supervisors in making their selections.

Two recent primers display radical differences in the type of training represented. The first[1] of these is a primer of the traditional type. The content is not new but includes, for the most part, the well-known stories which have been used in many of the previous books for children. The vocabulary contains but 282 words, although one of the purposes of the book, as stated in the Preface, is "to increase the hearing, speaking, and reading vocabularies of the pupil." The illustrations are numerous and, on the whole, good. The paragraphing is in the traditional form, the first line of the paragraph being extended rather than indented, thus setting up a habit which will eventually have to be displaced. Compared with the available primers, however, this book ranks well and is a good example of its type.

A primer[2] of an altogether different type has been prepared by Lucy Sprague Mitchell. The author has developed her method experimentally through contacts with children in the City and Country School of New York City. The radical character of the book is indicated by (1) the entire absence of pictures, (2) the size of the page, $7\frac{1}{2} \times 5\frac{1}{2}$ inches, with the lines running lengthwise on the page, (3) the nature of the vocabulary, which is based entirely on words used by six-year-old children rather than on those furnished by such a list as that given in Thorndike's *The Teacher's Word Book*, and (4) the nature of the stories,

[1] Mary B. Clinton and E. E. Lewis, *The Clinton Primer*. Austin, Texas: W. S. Benson & Co., 1924. Pp. 128.

[2] Lucy Sprague Mitchell, *The Here and Now Primer*. New York: E. P. Dutton & Co., 1924. Pp. xviii+124. $0.70.

which are written in the language of the small child and are entirely new in content. The author has prepared an interesting preface of ten pages in which she discusses her theory of teaching reading. One of her statements with regard to the character of primer material is open to serious criticism. This statement follows:

> The units (line or sentence or phrase) should be short, so that as soon as possible the child may read by the "eye-full," an eye-full being the span the eye can take in at one time and being variously estimated from 60 to 80 mm., or from $2\frac{3}{4}$ to $3\frac{1}{10}$ inches [p. x].

In applying this statement to the construction of her material, the author has inserted wide spaces between "eye-fulls" in order to set off the proper amount for each perception unit. The "eye-fulls" vary considerably in length, ranging from a word in some cases to a series of words covering as much as three inches. Considering the fact that experimental evidence has shown that the average perception span for first-grade children is approximately two-tenths of an inch —that is, an average of approximately eighteen fixations to a line three and one-half inches in length—one wonders how Mrs. Mitchell expects children to take in such enormous "eye-fulls." There is evidently some confusion in the use of perception units and recognition units. The lines in the primer vary in length from one-half inch to five inches. The paragraphing is unique.

Books One and Two of a new series of readers[1] display few new characteristics. In Book One the material is of the traditional type, although the stories are newly written. The content of Book Two is more attractive than that of Book One. Both books follow the method of using lines of uneven length, with paragraphing more or less at random. The illustrations are good. The brevity of the two books will limit their use primarily to supplementary purposes.

A book[2] which is written expressly for use as a supplementary reader has been prepared by Mabel G. La Rue. The book is similar in general character to the author's two previous publications, namely, *The F-U-N Book* and *Under the Story Tree*. The stories are new and attractive; the illustrations are excellent; and the activity exercises which are interspersed throughout the book are well planned. The vocabulary is simple; if the book is used in connection with the author's two preceding books, the pupil will encounter a total of twelve hundred words.

A book[3] of a purely imaginative type has been prepared by Etta A. Blaisdell. The content deals with imaginary children living in the sea, and the stories recount their experiences. The text is printed in four-inch lines, with extended

[1] Mary E. Pennell and Alice M. Cusack, *The Happy Children Readers:* Book One, pp. 94; Book Two, pp. 100. Boston: Ginn & Co., 1925.

[2] Mabel Guinnip La Rue, *In Animal Land*. New York: Macmillan Co., 1924. Pp. vi+158.

[3] Etta Austin Blaisdell, *The Kelpies*. Boston: Little, Brown & Co., 1924. Pp. 148.

rather than indented paragraphing. The illustrations are numerous and help to give meaning to the stories. No word-list is provided, but the material seems to be of approximately second-grade level.

Book One[1] of *The Story Reader* has a number of attractive features. The material is based on actual experiences of children, is organized in serial order, dealing with the same characters throughout the book, and is well written. The illustrations are in black-and-blue silhouette, making an interesting variation from the ordinary colored pictures. The book should appeal strongly to first-grade children.

A new addition[2] to the Horace Mann series of readers follows the same general plan as that of the New First Reader. The book contains many new stories and some very attractive illustrations. It is organized as a general basic reader and is accompanied by an appropriate manual.

A book[3] for third- and fourth-grade children which is essentially informational in character has been prepared by Margaret E. Wells and H. Mary Cushman. The plan of the book is unified throughout and is based on the experiences of a family in making purchases in a department store. The process of buying is made the occasion of presenting an extended body of information relating to the materials sold by the various departments. For example, in the chapter on the cotton-goods department there is an account of the whole process of making cotton materials, from the gathering of the cotton to the manufacture of the cloth. Other chapters deal with linen materials, silk goods, fur, lace, leather goods, etc. The information provided is good, and the illustrations are excellent. There is woven into the narrative, however, a certain amount of fanciful material, which detracts from the general effectiveness of the book. For example, one sees no need of having fairies in a department store. The purpose of the book would be equally served and the material equally interesting if it were based entirely on facts instead of being made up of an impossible mixture of fact and fiction. This one criticism, however, should not be emphasized unduly, since the content of the book, aside from its fanciful material, is excellent, and it should serve a useful purpose.

Primary teachers who have difficulty in providing sufficient busy-work for children will find many helpful suggestions in a new book[4] on paper-cutting. The book devotes some space to a discussion of the value of paper-cutting, gives directions for making various types of illustrations and posters, contains a brief chapter on the history of art, and discusses the practical uses of paper-

[1] Sara Cone Bryant, *The Story Reader*, Book One. Boston: Houghton Mifflin Co., 1924. Pp. viii+120. $0.60.

[2] Walter L. Hervey and Melvin Hix, *The Horace Mann Readers*, New Second Reader. New York: Longmans, Green & Co., 1924. Pp. iv+188. $0.72.

[3] Margaret E. Wells and H. Mary Cushman, *In Storeland*. Newark, New Jersey: Silver, Burdett & Co., 1924. Pp. viii+200.

[4] Annye Allison, *Paper Cutting*. Milwaukee, Wisconsin: Bruce Publishing Co., 1924. Pp. 160. $2.25.

cutting in school. The major portion of the book, however, is given over to numerous illustrations of designs to be used, there being 177 figures in the book. It is a very helpful volume for teachers.

G. T. BUSWELL

Educational psychology.—It would be more fitting to entitle the recent text[1] by Taylor "An Outline of Educational Psychology" than *Introduction to Educational Psychology*, as it is in reality a syllabus with brief statements under each heading. The treatment given is doubtless of value to those instructors who can adapt themselves to a syllabus and enlarge upon it and to those students who desire a hurried survey of "the leading facts and problems of educational psychology that are of vital importance in teaching" (p. 5).

The lists of book references which precede each chapter are fairly representative, although the author recognizes the fact that they need to be supplemented by the instructor. In the opinion of the reviewer, references in the body of the text, with specific readings bearing on each phase of a topic or problem, would be more helpful and fruitful. There seems to be no real reason why articles in periodicals, of which there are many of distinct value, should be omitted from the reference lists.

A number of problems are placed at the end of each chapter, many of which are stimulating to thought on the chapter. The majority of these problems, although leading to practical ends, are evidently theoretical. A few experimental problems are suggested, and it is apparently taken for granted that the instructor will be able to guide the student in the use of these. More experimental references and greater dependence on laboratory method would have given the work a more modern and authoritative content.

The tendency for students to write notes on the margins of texts has been recognized, and blank pages have been provided, leaving scarcely eighty-six pages of actual printed matter. It would be interesting to know just what students do with these blank pages. In case profitable use is made of them, it might be well to make them a feature of every text or to provide loose-leaf textbooks so that blank pages might be inserted according to need.

The book adds nothing new to the information in its field and fills no crying need. The author suggests its use "in connection with any elementary textbook in educational psychology or as an outline of the course in place of a text" (p. 5). Its chief value lies in the fact that it simplifies the field, perhaps oversimplifies it unless it is wisely used and amplified. A sketchy treatment is almost certain to result in inaccuracies. For example, the general statement that "there is no transfer of training" (p. 116) is at best only a partial truth and needs more thorough definition and treatment than is given before it can be accepted.

PAUL V. WEST

UNIVERSITY OF CHATTANOOGA

[1] Howard Taylor, *Introduction to Educational Psychology*. Baltimore: Warwick & York, Inc., 1925. Pp. 172.

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The use of graphic presentations in education.—The use of graphs and diagrams for the presentation of data is now so common that one of the problems of such use is the standardization of the forms of graphs and the utilization of the most suitable types. Since the effective use of graphs depends to a considerable extent on the adoption of certain uniform conventions, a recent book[1] which treats this whole problem should be of particular value.

In this book there are 148 experimental graphs, charts, and other figures, together with a detailed consideration of the whole problem. The author first discusses the purpose and value of graphic methods. He then presents a chapter on the making of charts, in which he describes the materials and instruments to be used and gives simple instruction in ruling and a short treatment of lettering. The major part of the book is given over to a consideration of such topics as "Bar Representations," "Curves," "Frequency Surfaces," "Block Diagrams," "Organization Charts," "Maps," "Picture Graphs," and "Verbal-Display Charts."

If those who write articles for publication or prepare extended papers or theses would consult this book before making their visual representations, the quality of their diagrams would be greatly improved. The book meets a real need in the field of education and provides an excellent handbook for the use of students.

Mathematics for Grades VII and VIII.—Teachers of mathematics in the seventh and eighth grades who are interested in the reorganization of the mathematics courses of these grades will find it worth while to study Barber's textbook on junior high school mathematics.[2]

The author discusses recent proposals for improvement in the content and the teaching of arithmetic, algebra, and geometry. The first part deals with the new mathematics in Grades VII and VIII; the second part, with the mathematics in Grade IX. The book aims to help the reader to see the difference between the new algebra and the old mechanical algebra of the first year of the high school and to understand the meaning of the new geometry. It also discusses the important features of the new arithmetic. Emphasis is placed on the importance of computation in arithmetic, of measurement and drawing in geometry, and of the use of algebra as a tool for solving problems.

It is evident that the author's views are based on wide experience and a thorough study of many proposed reforms. The book enables the teacher to familiarize himself in a short period of time with the important changes in the mathematics courses of Grades VII and VIII.

E. R. BRESLICH

[1] J. Harold Williams, *Graphic Methods in Education.* Boston: Houghton Mifflin Co., 1924. Pp. xviii+320. $2.00.

[2] Harry C. Barber, *Teaching Junior High School Mathematics.* Boston: Houghton Mifflin Co., 1924. Pp. x+136. $1.20.

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